

creative computing 1983

SOFTWARE BUYER'S GUIDE

\$3.95

Directory of
Personal Computer
Software & Manufacturers

How to Buy

A Word Processor
A Database Manager
Business Software
Educational Software
Recreational Software

What Is CP/M?

In-Depth Evaluations:

TK! Solver
VisiOn
Paint & Video Easel

Games for

Color Computer
TRS-80
Apple
Atari
IBM
VIC-20



WHICH PERSONAL COMPUTER GIVES YOU BUILT-IN EXTENDED MICROSOFT® BASIC PLUS ALL THIS:

- 32K Built-in ROM expandable to 96K
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- 3.6 MHz clock for fast data processing
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- Built-in Joystick/Cursor control

AND STILL LEAVES YOU MONEY FOR SOFTWARE?

Turn page ►

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THE REMARKABLE SV-318 PERSONAL COMPUTER

You'll grow into it, not out of it.



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SV-601 SUPER EXPANDER

The real value in any computer system lies in its ability to accommodate a large variety of input/output devices simultaneously. With the addition of the SV-601, the SV-318 can interface with as many as seven different devices at one time. Although lightweight, the SV-601 can support a 15" T.V. monitor. Special front view slots have been designed to monitor the operation of the different interface cards that are connected to the system.



SV-903 DATA CASSETTE

This feature packed data cassette is powered from the SV-318, to which it is connected. By using a stereo headset, data on one channel, and voice on the other. This greatly enhances the use of stored data. Programs such as foreign language tutorials and voice assisted training and data stored. The data cassette can be an integral part of your system or choose to expand into a disk drive. The cassette even has a built-in condenser microphone you write your own voice support programs.

ABLE MPUTER: out of it.



FOR UNDER \$300

Man has only recently tested the waters of the home computer age, and he has found the waters to his liking. But with a brain capable of storing several trillion bits of information, he will be continually pushing his new found toy to greater limits. Will his machine live up to this challenge?

Sadly, many personal computers will become tomorrow's junk in the attic. The SV-318 is one that will not. Because as you get better, it gets better. It does so because of its capability and expandability—both far beyond those of any other affordable computer.

CAPABILITY. The SV-318 isn't just more capable. It's much more capable. No other computer at even twice the price combines all these extraordinary features: 32K ROM expandable to 96K; 32K RAM expandable to 144K; Extended Microsoft Basic (the industry standard); even Standard CP/M 80-column capability so you can immediately utilize over 10,000 existing software programs. The SV-318 also has a unique built-in joystick/cursor control—an immeasurably useful feature when it comes to playing your favorite video game.

EXPANDABILITY. As you become more and more skillful with computers, you'll love how the SV-318 "stretches" to meet your demands (and actually leads you in fascinating, new directions). For one thing, all eleven of our important peripherals are available immediately. With most other models, you have to wait months. For another, the SV-318 is beautifully designed to interface with new options as they become available.

AFFORDABILITY. The SV-318 is not only eminently affordable, it's the first true bargain of the computer age! Besides home budgeting, business applications, word processing, programming and self-teaching, the SV-318 is the best entertainment value in town. Not only can you use it with your TV to play hundreds of different video games, you can also use your SV-318 with a TV as a drawing tablet or music synthesizer. In play, as in work, the SV-318 will continually expand to meet your potential.

Whether you're just wetting your toes in computers, or fully at sea on the waters, the SV-318 is a computer that will serve you for many, many years. You see, we believe that even in the computer age, you don't become an object of real value unless you're around for a while.

SPECTRAVIDEO SV-318 COMPUTER COMPARISON CHART

	SPECTRAVIDEO SV-318	APPLE II PLUS	ATARI 800	COMMODORE 64	NEC 6001	RADIO SHACK COLOR COMPUTER
BASE PRICE	\$299	\$1,540	\$899	\$595	\$399	\$299
COMPUTING POWER FEATURES						
BUILT-IN ROM	32K	12K	10K	20K	16K	8K
EXPANDABLE TO	96K	N/A	42K	N/A	32K	16K
BUILT-IN EXTENDED MICROSOFT [*] BASIC	YES	YES	ADDITIONAL COST	NO	YES	ADDITIONAL COST
BUILT-IN RAM	32K [*]	48K	16K	64K	16K	4K
EXPANDABLE TO	144K ^{**}	64K	48K	N/A	32K	16K
KEYBOARD FEATURES						
NUMBER OF KEYS	71	51	61	66	71	55
USER DEFINE FUNCTIONS	10	N/A	4	8	10	NONE
SPECIAL WORD PROCESSING	YES	NO	NO	NO	NO	NO
GENERATED GRAPHICS (FROM KEYBOARD)	YES	NO	YES	YES	NO	NO
UPPER/LOWER CASE	YES	UPPER ONLY	YES	YES	YES	YES
GAME/AUDIO FEATURES						
SEPARATE CARTRIDGE SLOTS	YES	NO	YES	NO	NO	NO
BUILT-IN JOYSTICK	YES	NO	NO	NO	NO	NO
COLORS	16	15	128	16	9	9
RESOLUTION (PIXELS)	256 x 192	280 x 160	320 x 192	320 x 200	256 x 192	128 x 64
SPRITES	32	N/A	4	8	3	N/A
SOUND CHANNELS	3	1	4	3	1	1
OCTAVES PER CHANNEL	8	4	4	9	8	10
A.D.S.R. ENVELOPE	YES	NO	NO	YES	YES	NO
PERIPHERAL SPECIFICATIONS						
CASSETTE	2 CHANNEL	1 CHANNEL	2 CHANNEL	1 CHANNEL	1 CHANNEL	1 CHANNEL
AUDIO I/O	YES	NO	YES	NO	NO	NO
BUILT-IN MIC	YES	NO	NO	NO	N/A	NO
DISK DRIVE CAPACITY (LOW PROFILE)	256K	143K	96K	170K	N/A	170K
	YES	NO	NO	NO	NO	NO
CP/M[†] COMPATIBILITY (80 column programs)						
CP/M [*] 2.2	YES	NO ^{***}	NO	NO ^{****}	NO	NO
CP/M [*] 3.0	YES	NO	NO	NO	NO	NO

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SV-902 FLOPPY DISK DRIVE

This extremely compact, low profile unit uses standard 5 1/4" flexible diskettes. Its single side double density configuration allows a capacity of 256K bytes of data (unformatted). Linked to the Super Expander, the SV-902 is your key to the virtually unlimited scope of CP/M O/S as well as a complete variety of program languages such as LOGO, PASCAL, FORTRAN, COBOL and PL-1.

SPECTRAVIDEO™
SV-318
PERSONAL COMPUTER

SPECTRA VIDEO INC. 39 W. 37th Street, New York, N.Y. 10018
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* 16K user addressable plus 16K graphic support
** 128K user addressable plus 16K graphic support

*** Apple II can accept modified 40 or 80 column CP/M
**** Commodore 64 accepts 40 column CP/M

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This month's stars:

Games of strategy, fantasy, science fiction,
sports, even education for the
Apple II, Atari, Commodore,
TRS-80 and IBM Personal
Computers.

NEW

BREAKTHRU—Don't take our word for it! Here's what *Color Computer* magazine has to say: "This is truly a good game". Short and sweet as this description may be, **BREAKTHRU** is really much more than just a truly good game! It's a combination of racquet and WALLBALL. The object is to knockout five consecutive walls at the opposite end of the court using a joystick paddle to strike or deflect the lively ball. **BREAKTHRU** is written in pure machine language to give you a fast-action, three-dimensional, high-resolution experience for hundreds, maybe even thousands of hours of entertainment. For the TRS-80 Color & TDPS-100 Computer Systems with 16K Memory, \$20.00

S.C.I.M.M.A.R.'s—Surface Contra-Gravity Individual Manned Mobile Anti-Vehicle Raiders . . . S.C.I.M.M.A.R.'s is gladiatorial armor combat in the far future. Heroes drive personal combat vehicles more akin to modern jets than tanks, with immense speed and acceleration. It is combat of maneuver, reflex and quick thought where only the best survive. For use with Apple II computer systems with 48K and disk drive, \$30.00.

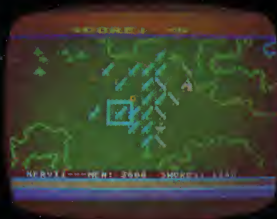
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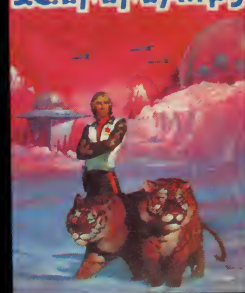
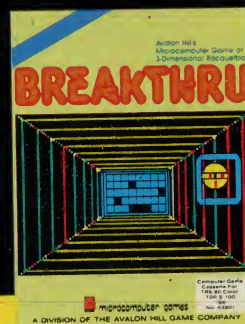
We'll tell you the names of the leading
computer software and hobby stores
in your area who offer the full range of

microcomputer games®

CIRCLE 103 ON READER SERVICE CARD



NEW **S.C.I.M.M.A.R.'s**



T.A.C.—This is Tactical Armor Command by Ralph Bosson, Avalon Hill's Microcomputer Game of Armored Combat during World War II. You control individual tanks, anti-tank guns, and infantry squads in tactical combat situations. Official armor statistics are utilized. For one or two players featuring outstanding hi-resolution graphics, enhanced sound, and stimulating challenge. Five different scenarios are available from Meeting Engagement, Rear Guard, and Static Defense, to Breakout and Stalemate! The player(s) control up to eight vehicles, guns and squads simultaneously, utilizing the equipment of either the German, British, Russian or American forces. A microcomputer simulation for the most demanding gamers. For the Apple II computer systems with 48K and disk drive, Atari 800/1200, IBM P.C., and Commodore 64 versions available later this fall. \$40.00

LEGIONNAIRE—Highly acclaimed real-time wargame simulation by Chris Crawford. You as Julius Caesar command up to ten legions against the barbarian infantry and cavalry during the days of the Roman Empire. The battlefield scrolls before you in full color and animation. Such a unique and pleasant departure from traditional wargames that *Video Games Player* magazine has awarded **LEGIONNAIRE** the 1983 "Golden Joystick Award"! Atari 4/8/1200 cassette (16K) \$35.00, diskette (32K) \$40.00, joystick required.

TELENGARD—Another not so mighty adventurer bites the dust! Hailed in the February 1983 issue of *Playboy*, "TELENGARD is one of the most powerful examples of the challenging diversions your computer can offer these days." Telengard is a 50-level dungeon exploration game featuring sprite graphics and sound for your Commodore 64. The monsters and creatures in the Telengard dungeon will not wait for you to react, so quick wits and reflexes are needed! Will you return from the cruel labyrinth to tell tales of horror, despair, great treasure and magic? Or will you be another of the foolish ones, only to perish in the dark depths? Commodore 64, TRS-80 Mods. I/III (32K), Atari 800/1200 (48K) cassette \$23.00, Apple II (48K), Atari 800/1200 (48K), TRS-80 Mods. I/III (48K) diskette \$28.00 each.



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Contents...contents...contents

- 6 How To Buy Word Processing Software**Fastie
- 12 How To Buy A Database Manager**Hart
- 16 How To Buy Business Software**Costarakis
- 20 What Is CP/M?**Terry
- 24 How To Buy Educational Software**Ahl
- 32 Learning Can Be Fun**Ahl
29 educational programs for Apple and Atari
- 70 VisiOn**Jeffries
VisiCorp's answer to the Xerox Star and Apple Lisa
- 76 TKISolver**Ahl
A computing tool for professionals
- 85 Paint And Video Easel**Anderson
Electronic canvas meets lost masterpiece
- 90 Food For Thought**McComb
Health-Aide, Nutrichec and Nutritionist
- 94 How To Buy Entertainment Software**Anderson
- 100 Starcross**Anderson
An interactive sci-fi thriller
- 102 Apple Arcade Games**Staples, Ahl & Coffey
Spider Raid, Evolution and Frogger
- 104 Apple Adventures**Murphy
Four new ones and an upgrade
- 110 Notes From The Atari Arcade**Anderson
Five outstanding games for the Atari
- 116 Games For The IBM PC**Linzmayer
Astro Dodge, Cosmic Crusader and Pool
- 120 Games For The TRS-80**Friedenberg & Renne
Submarines, humans, earthquakes and spiders
- 128 TRS-80 Color Computer Games**Devlin
Tube Frenzy, Planet Raider, and Alphabet Soup
- 135 The Playful Vic**Linzmayer
Aggressor, Apple Panic and Galactic Blitz

Directory Of Personal Computer SoftwareDevlin

- 138 Systems Software**
- 140 Utilities**
- 145 Data Management**
- 148 Communication**
- 150 Word Processing**
- 153 General Business**
- 164 Personal Finance and Record Keeping**
- 166 Education**
- 183 Personal Interest and Development**
- 189 Recreation**
- 194 Music and Graphics**

198 Directory Of Software ManufacturersZollo

Creative Computing Software Buyer's Guide



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staff

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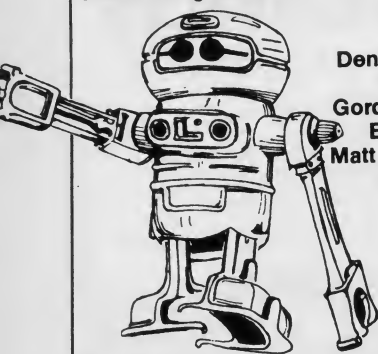
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Managing Editor **Peter Fee**

Associate Editors **John Anderson
Joseph Devlin
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Editor-at-Large **Ken Uston**

Contributing Editors **Chris Terry
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Creative Computing Press **Laura Conboy**

Operations Manager **Patricia Kennelly**

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Shipping & Receiving **Ronald Antonaccio
Mark Archambault
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advertising sales

Advertising Director
Jeff Weiner
Creative Computing
Ziff-Davis Publishing Company
One Park Avenue
New York, NY 10016
(212) 725-7957

Advertising Coordinator
Ruth Darling
Creative Computing
Ziff-Davis Publishing Company
One Park Ave.
New York, NY 10016
(212) 725-3446

Northern California, Northwest
Jeff Miller
Ziff-Davis Publishing Company
3030 Bridgeway Blvd.
Sausalito, CA 94965
(415) 331-7133

Southern California, Southwest
Tom Whiteway
Ziff-Davis Publishing Company
3460 Wilshire Blvd.
Los Angeles, CA 90010
(213) 387-2100

New England
CEL Associates, Inc.
27 Adams Street
Braintree, MA 02184
(617) 848-9306

Midwest
Jeff Edman
The Pattis Group
4761 W. Touhy Ave.
Lincolnwood, IL 60646
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**Consumer Computers & Electronics
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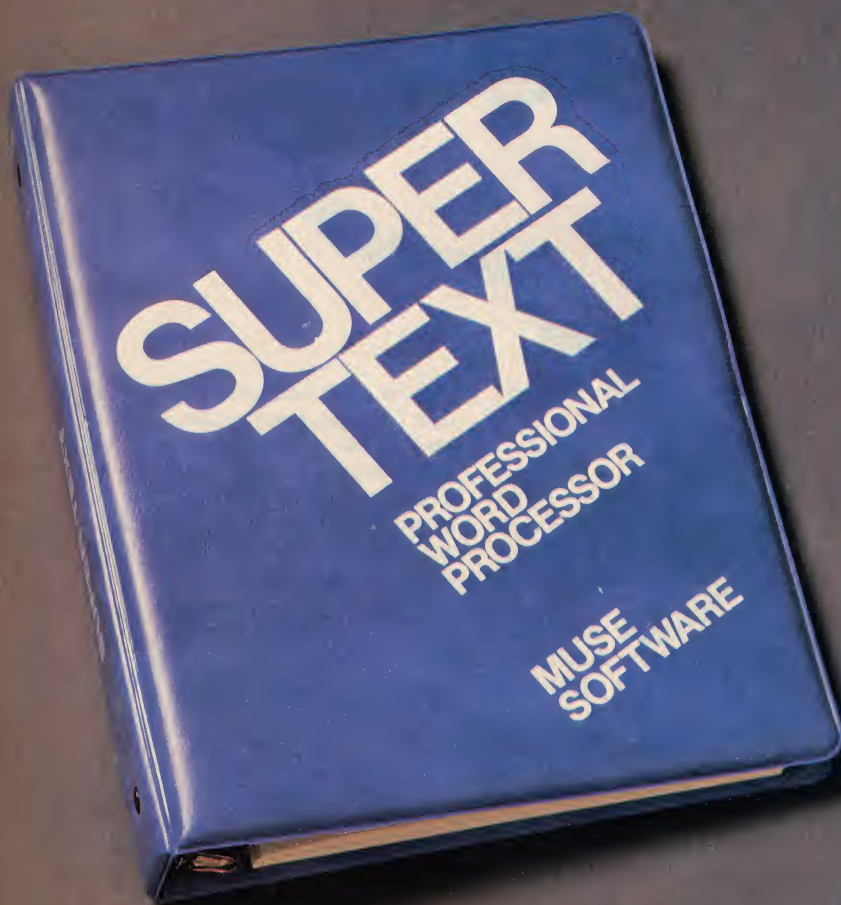
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SUPER-TEXT Professional does everything the competition does, except one thing.



Cursor Movement	Text Movement	
RETURN Up	+ Set direction forward	1 Introduction
← Left	- Set direction back	2 Block Operations
→ Right	L Scroll one line	3 Printer Formats
/ Down	P Scroll one page	4 Main Help
		5 Turn Help ON/OFF
Disk and Printer	Miscellaneous	Changing or Deleting Text
FL Load text	F Find text string	1A Add text at cursor
FS Save text	R Replace text string	1C Change text at cursor
X Print text	IV Insert block marker	1D Delete text at cursor
FN Page eject	ESCZ Delete all text	1E Delete line at cursor

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LJ9-

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LJ9A

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LJ9

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How to Buy Word Processing Software

That so many word processing programs exist for so many different computers is a blessing in disguise. The blessing: the broad range gives you, as the buyer, the best chance of finding a program that fits your needs. The disguise: that same broad range enormously complicates your search.

The first step, as always, is to understand what you are trying to accomplish. This might be helped along somewhat by recognizing that different kinds of writing have characteristics that can be served by different types of word processors. Three distinct kinds of writing are letters, manuscripts, and formal papers.

Letters usually require little more than an electronic typewriter. Simple text editors, therefore, can often serve this purpose quite well. Look for the ability to format your text on the screen and then print what you see. Be sure the act of printing is simple; if not, you will ultimately feel that a good typewriter would have been a better deal. If you intend to do a mailing campaign, however, these simple programs will not be up to the task.

Manuscripts require a full set of word processing functions. Because revision of your document will be a frequent activity, you must be sure the word processor provides excellent navigational control. It must be simple and natural to move the text around and to position yourself anywhere, for any purpose. Search functions must be available for this purpose. And, because manuscripts tend to be large, be sure the program allows easy movement through the entire body of

Will Fastie

the document. Finally, since manuscripts must usually be double-spaced, be sure the program can control line spacing.

Formal papers are similar to manuscripts, but demand further functions. Footnotes are important, but supported by only a handful of products. Search and replace, as opposed to simple searching, is often helpful for a technical paper in which, for example, units of measure might have to be made consistent after the paper is done. Long direct quotations demand the ability to switch easily between single- and double-spacing and to indent an entire paragraph. More advanced functions include indexing and automatic table of contents generation.

Be advised that increasing function implies increasing price, so be prepared to spend more for the better products. You must consider the price of the software in light of the time the better packages can save you over the long haul.

Once you have decided upon the general type of work you will be doing, collect recent issues of magazines you respect and read up. Become as well informed as you can before you start looking. Talk to your friends who own computers, even if they have different makes. Try their programs if you get the chance, and try to learn how they go about doing their word processing work.

Now that you have thought and studied, it is time to visit your local retailers. First, be sure to visit more than one. Even a retail store will have its pref-

erences, both because the owners are human (we hope) and because a given store can't know a large number of products well enough to support them. Visiting more than one store will at least give you a bigger range of choices, and if they appear to be the same, you will have learned something just from that fact.

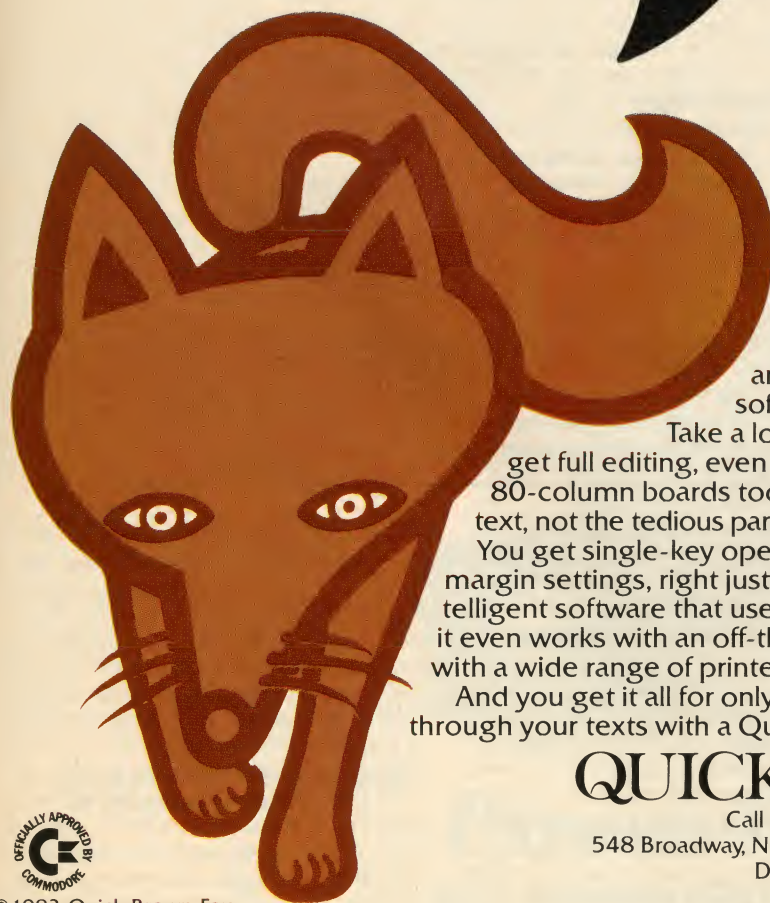
Second, spend some time in the store using the program you might buy. Go prepared with several pieces of real work, and take the time to do them. Accept only limited help from the salesperson at this point, but later make the salesperson show you all the advanced features of the product. If he can't, find out why. Don't settle for cursory attention by the sales staff, especially if the product is an expensive one.

There is no substitute for this hands-on experience, especially if you gain it for several products. By the time you have tried three you will have a good feeling for which product you think will best meet your needs, at which time you can go back and try it again with something different, just to be sure. Getting hands-on time means that you should beware of buying the program from a mail order firm, unless you have a chance to try the product first; in any case, be fair and don't string a retailer along unless you intend to buy from that store.

Third, examine the advanced features the program provides. See how they work, and if they are useful. Look at the vendor's literature to see what features they tout, because those are the ones of which they are proud and for which you will be paying.

Among the features you may want to consider is the ability of the program to communicate with other programs.

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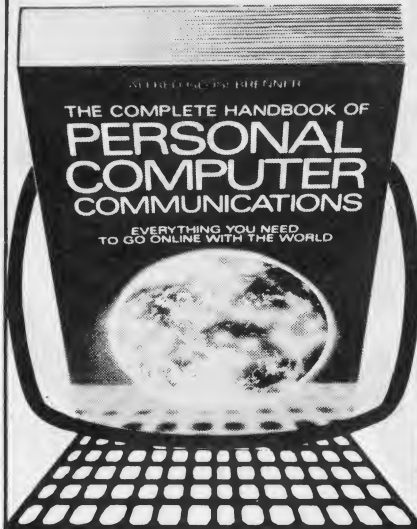
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Word Processing, continued...

Word Processing Features: What To Look For

For Letter Writing:

- Utter simplicity
- Easy to print
- Fast
- Inexpensive
- Whatever else you can get for the price

For Manuscripts:

- Excellent human factors (may be harder to learn, but you save time in the long run)
- Superb navigation
- Ability to handle documents of arbitrary size
- Block operations (copy, move, delete, write, read)
- Search Operations
- Formatted on-screen display (what you see is what you get)
- File System operations from within word processor
- Headers and footers
- Margin and spacing control

For Technical or Formal Papers:

- All of the above plus:
- Footnotes
- Temporary indentation
- Search and replace operations
- Superscript and subscript capability

For all:

- Excellent error detection and recovery
- Ability to handle "disk out of space" condition
- On-line help facility
- Quick reference card
- Sample files included with purchase
- Vendor "hotline" for assistance if retailer can't help

Other Considerations:

- Your printer supported
- Flexibility of printer choice (in case you buy a different one later)
- Ability to read straight text files (data import)
- Ability to write straight text files (data export)
- Display and print bold and underlined text
- Control of single sheet printing
- Ability to embed arbitrary printer control codes

Some word processing programs can integrate and print spreadsheet files along with your text. Some can merge names, addresses and other data from mailing list programs and databases into form letters.

Determine which features are necessary or desirable. Try to make sure that the features you want can be used: sometimes a feature seems terrific until you discover that it is a pain to use.

Finally, make sure the word processing program you decide to buy can handle the printer you own or are buying. If possible, experiment with a system that has the printer on it, or convince the store to let you return the product for a

full refund if you can't get the printer working in some reasonable time, like a week. Give it a stress test: try as many features as you can think of to be sure the program knows the printer intimately. And don't forget to get the sales staff to state that the program and the printer go together, in writing if possible. If you later find out they don't, you will have quite a battle on your hands.

In general, try to become comfortable with the program. If you can't, forget it. Give yourself time and the program the benefit of your lack of experience, but be critical. Remember, you and this program are going to become intimate, and divorce is painful and expensive. □

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Total control editing.

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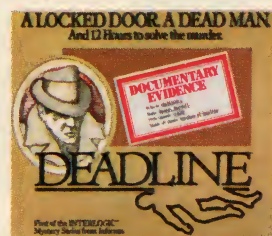
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How To Buy a Database Manager

There are a few main classes of software products that nearly every computer user needs sooner or later. Word processing (and its related form letter merging utilities, spelling checkers, footnote handlers, and index generators), high level languages like Basic, Pascal, and Fortran and spreadsheet software are the standards that are sometimes included with the purchase of the computer itself or added later.

Also in this "must have" class is a database management program. One of the most powerful and general types of software available, DBMs range from simple minded to incredibly complex. A long and sturdy shelf would be required to hold just a sampling of the thick books written on database management, so we shall cover just a few essentials which can help you understand what a DBM is and determine what to look for in yours.

At the most basic level, a database manager is a tool which helps you collect information and retrieve it in a useful form. All DBMs require that the data be structured in some way. The most common concept is that information related to one entity, be it a name in a mailing list or a part in an inventory, is called a *record* and the individual pieces of information about the entity (address, city, state and zip code for a name; part number, stock on hand, cost, etc. for a part) is known as a *field*. The DBM requires that you define what information is to be stored in each

Glenn A. Hart

record by indicating how long each field is and what kind of information it will contain (text, numbers, dates, etc.).

How many records and fields and, to a lesser extent, what kinds of data can be specified are the most important things to examine in a DBM you are considering. A limited DBM may allow only a small number of fields (perhaps 16 or 32) and relatively few records. Many DBMs limit the total *combined* number of characters in all fields of a record to some small number like 255. Limitations like these are not a major problem if your intent is only to put your Christmas card mailing list on the computer but can make a DBM unusable for serious or business tasks.

Once you have defined the data structure, data can be entered. DBMs vary widely in how much help they give you in the entry process and how attractive the entry screen on the terminal is. Some DBMs allow you to specify how you want the screen to look, which can result in a more professional appearance; some programs make such screen definitions reasonably easy to set up while others require knowledge of programming techniques.

Help

The question of help is another major distinction between DBMs. While "buzzwords" like *user-friendly* and *human engi-*

neering may have been overused lately, nowhere are they more important than in a complex system like a DBM. Some big sellers offer you practically no assistance (requiring you to learn their commands and procedures by long study of the manual and much practice), while others lead you by the hand each step of the way. Only you know how much help you need, so insist on seeing programs you are considering in operation and trying them yourself.

Once your information has been entered into the computer, most DBMs allow you to examine records, change data, add more records, and delete records you don't want any more. As usual, some programs make such *file maintenance*, as it is known, easier than others.

Occasionally you may want to examine your data in the order in which you entered it into the computer, but far more often you will be interested in examining and retrieving information in some sorted order such as alphabetically by last name, part numbers, zip code or whatever. There are many different schemes for accomplishing this. Some DBMs allow (or require) the actual file to be *sorted* in the order you want. While this seems like a reasonable method, there are better ways. Sorting can be a time consuming process, especially if you have a great deal of information in your database.

A concept called *indexing* can save lots of time and make a DBM more powerful. There are many different indexing schemes, each with its pros and cons, but

Glenn A. Hart, 51 Church Road, Monsey, NY 10952.

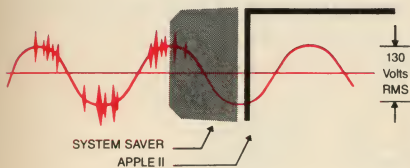
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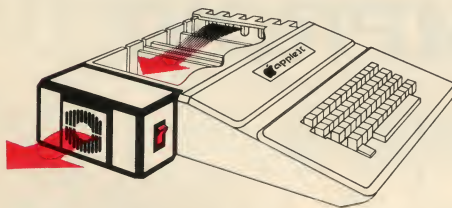


By connecting the Apple II power input through the SYSTEM SAVER, power is controlled in two ways: 1) Dangerous voltage spikes are clipped off at a safe 130 Volts RMS/175 Volts dc level. 2) High frequency noise is smoothed out before reaching the Apple II. A PI type filter attenuates common mode noise signals by a minimum of 30 dB from 600 khz to 20 mhz, with a maximum attenuation of 50 dB.

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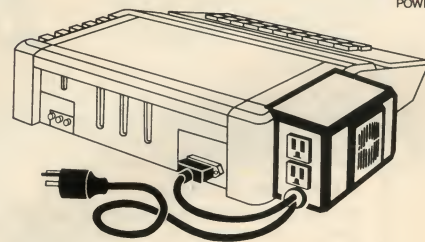
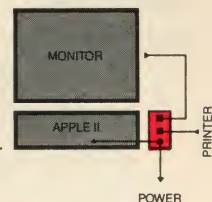
Today's advanced peripheral cards generate more heat. In addition, the cards block any natural air flow through the Apple II creating high temperature conditions that substantially reduce the life of the cards and the computer itself.



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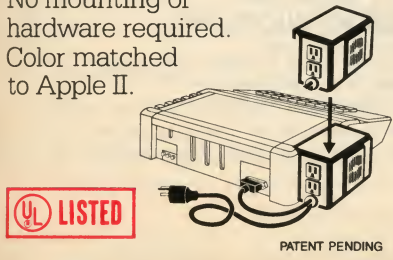
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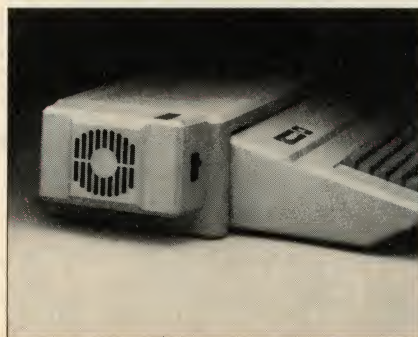
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Database Manager, continued...

the general idea is usually to create a separate file which contains a *key* value based on the field (or fields if the DBM allows multiple keys) on which to arrange the data. Along with the key, the index file has an indication of where in the main data file the record is located. Since the key file is much shorter than the main file, it can be sorted much more quickly. Many different index files can be created for one data file, allowing you to access information in many different orders without ever sorting the main data file itself. Indexing is an important aspect of DBM design, and the more sophisticated the indexing scheme, the easier it will be to retrieve your information in clever and useful ways.

Most DBMs allow you to place conditions on what data to examine and/or retrieve. Sometimes called *selection definitions*, this is the feature that allows you to specify some subset of all the data that meets a certain criterion you want to establish. For example, you might want all the people on your mailing list from one state or all the parts which are out of stock. A more sophisticated DBM permits combining your choices in complex patterns, so, for example, you can select customers in region one who have purchased a certain item and whose equipment cost more than a specified amount.

Report Generation

Perhaps the most important DBM function once the data are entered and edited is *report generation*. The simpler DBMs may allow you only to *dump* the data in the same form as it is stored or they may allow you to specify which fields to include in the report, perhaps with headings for the printed page. Some programs may also have provisions for printing mailing labels, and almost any DBM which has selection definitions allows you to specify which classes of records would be included in the report.

Sophisticated report generators can produce almost any report imaginable.

More sophisticated report generators can produce almost any report imaginable, including such non-tabular printouts as invoices, checks, and multi-line per record reports. Various statistical abilities, such as sub-totals and totals for numeric columns, departments, each page of the report, etc., may be included. Some DBMs have provisions for designing complicated reports through an interactive

dialog with the user, while others may require the use of a programming language which is part of the DBM or one that the user must provide.

It is an unavoidable cliché that with flexibility comes complexity. Those DBMs with powerful report generators but no programming language require careful planning and attention to detail to design a complicated form, but at least avoid the need for programming expertise. The DBMs which require programming ability allow those with the necessary skills to do almost anything in report generation or data manipulation. As usual, investigate this issue in the context of your skills before buying.

There is such a wide variety of DBMs available that it is unfortunately almost as easy to buy one that is too simple for your needs as one which is beyond your requirements or capabilities. Of course, the prices charged cover just as wide a range. While we have just touched on the basic concepts of what database management programs do, there is probably no single class of software that can perform more useful functions for you. The time and effort necessary to pick the right one will be repaid many times over, so do your homework, look at many different programs and, hopefully with our help, buy the best one for you. □

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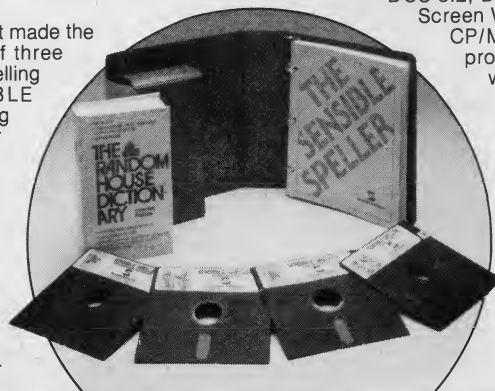
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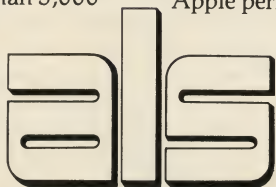
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How To Buy Business And Investment Software

What is the best way to buy business and investment software? Probably not by mail. (For the purposes of this article, the term business software includes software such as payroll, general ledger, inventory and similar software associated with various accounting and record keeping practices. It will also be used to include investment software for real estate, stocks, bonds, taxes and miscellaneous forms of investment. In fact, any and all software that comes under the general heading of computational or analytical software.)

Business software, by its very nature, should save time, provide solutions, and at the same time be easy to use (user-friendly). More important, any business software you purchase must meet your specific needs for your particular application.

No advertisement or brochure can provide sufficient information on which to base a purchase decision; they serve mainly to pique your interest in the product. Remember, all advertisements are designed to press as many "hot buttons" as possible, so the reader will buy or request additional information. Unfortunately, some ad writers can get carried away with the descriptions and capabilities of the product. That handy little Latin phrase *caveat emptor* hasn't lasted 2000 years for nothing—buyer beware!

Dennis A. Costarakis, 3562 Union Street, San Diego, CA 92103.

Dennis A. Costarakis

Once you have determined that you either need or want a program to satisfy a specific application, the real work begins. The first step in buying software is to make a comprehensive list of all the functions, computations and analyses that you want to perform.

***That handy little
Latin phrase caveat
emptor hasn't lasted
2000 years for
nothing—buyer beware!***

If it is a tax preparation program you are looking for, list all the schedules you want to have prepared. Do you want it to do your state tax, too? Is it a 1981 version or has it been updated to include the 1982 tax law changes. Is it going to take you longer to figure out which program to buy than to do the return by hand, or will it be cheaper to have a CPA do your returns than to buy the software? Will the software manufacturer allow you to trade

in the 1982 software for a nominal charge to get the 1983 software with its inevitable tax law updates, or will you have to pay full price each year?

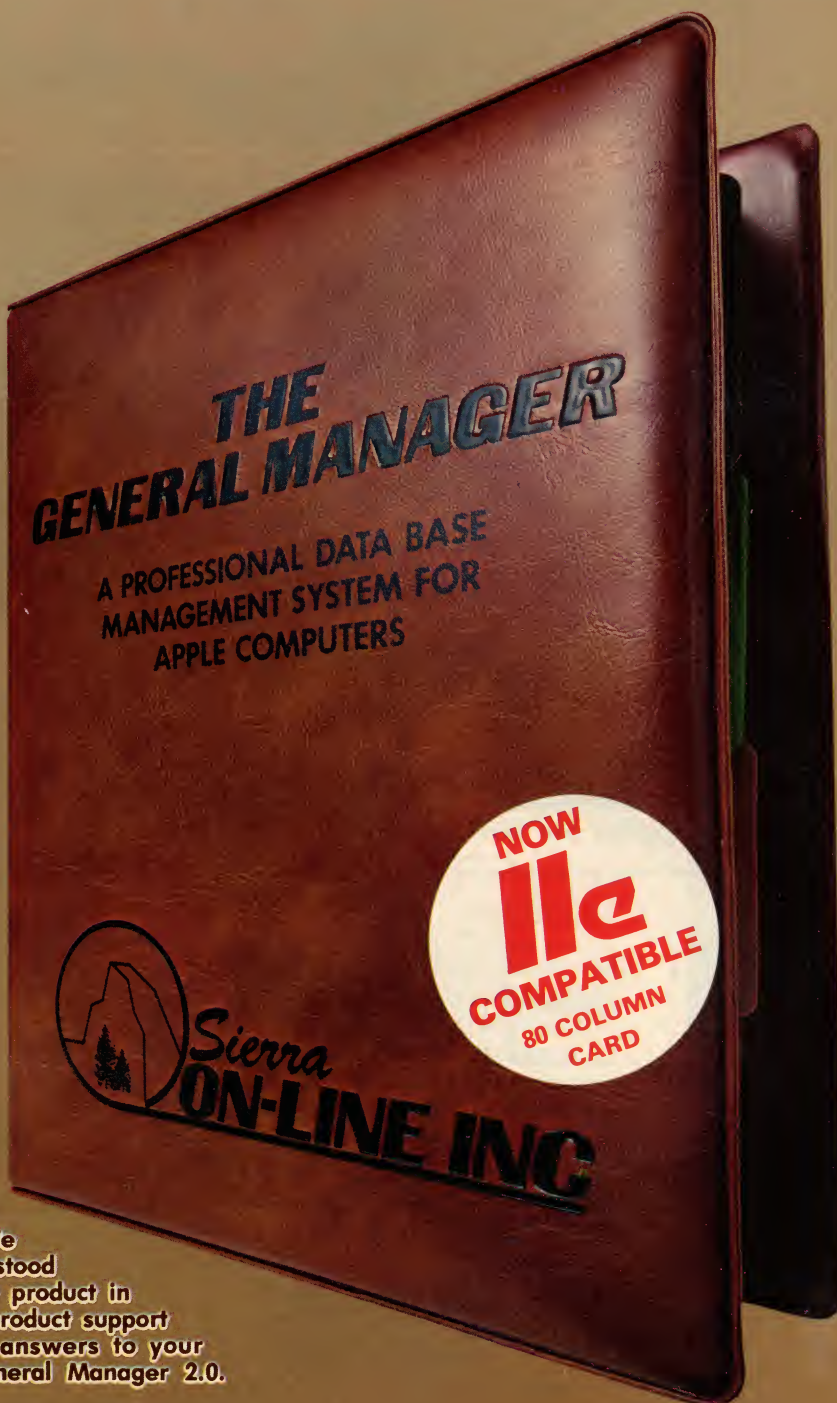
Does the inventory program you want allow you to value the inventory at any point in time? If so, do you need LIFO (last in, first out) or FIFO (first in, first out) valuation? Does the program allow you to change from LIFO to FIFO, or vice versa, if you change your inventory valuation method? These are just two examples of the kinds of questions you should ask yourself.

As you can see, making a comprehensive list of program attributes requires careful thought and insight. If you now perform manually the application you want to computerize, try making the list as you perform the computation/application and include the amount of time it takes you to perform each step. Also list where and how data are obtained. Can the data you require be obtained electronically or must it be entered manually? If you have specific needs, such as charting stocks, list them and list also any special equipment constraints you may have. For example, does your printer have graphics capability? If so, does it require special software drivers or interface cards to make it print graphics?

If you plan to do graphics with your computer, you should plan to buy a printer buffer or you will spend a great deal of time waiting to use the computer while it feeds data to the printer. Printing charts

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Business Software, continued...

is a time consuming process.

Once you have made your list of desired program attributes, divide the list into three priority groups: required capabilities, desired capabilities, and nice to have capabilities. It is only at this point that you should begin to read the ads and start to compile a list of available software that, according to the ads, seems to have at least the *required capabilities* of your attribute list.

As you find ads, send away for descriptive brochures and request any additional information, including computer printouts produced by the software, the manufacturer can provide. Also request a copy of the table of contents of the manual and any other information you might like to have, such as how many companies of your company's size are using the software. Some software producers will not provide anything more than a descriptive brochure, but it never hurts to ask.

In addition to ads, round up magazine reviews of each software package under consideration. Most microcomputer magazines review new software releases. But there has been a paucity of annual or quarterly indexes to facilitate finding the reviews. A new publication called *LAMP*, Literature Analysis of Microcomputer Publications, has just begun publication. The first issue indexed articles and reviews from 77 periodicals. *LAMP* and periodical cross reference publications at your local library should help you locate pertinent software reviews.

As good and helpful as software reviews are, there is no substitute for actually trying the software yourself. Since most business programs cost over \$100, and

most more than several hundred dollars each, it is very important to try a program before buying it.

Stores specializing in the sale of software are springing up around the country. These stores generally have a broad selection of business software in addition to a myriad of games and books.

Try to find a local store that stocks the programs you are considering so you can run and test the software. Be sure the hardware configuration is the same as yours. I am currently waiting to receive the latest firmware revision for my 80-column card so that I can complete a program evaluation. The new program does not run with the old firmware on the 80-column card and must, therefore, be run in the 40-column mode. This is an example of the kind of problems that can crop up if you don't plan carefully.

Try to find a store that can demonstrate the program adequately. Unfortunately, most salespeople are not knowledgeable about business software. You may find that some of them are good with word processors, marginal with accounting software, and probably strangers to investment software and tax preparation packages. Try to find the ones who are most familiar with the package you want.

Check with members of your local user group to see if any members have, or are using, any of the software packages in which you are interested. Most user group members are happy to share information and demonstrate the programs they use. If you are planning to buy a large or expensive software package (more than \$500-\$1000), consider obtaining the ser-

vices of a consultant or a company specializing in business computers and software. If you to live near a city large enough to have a computer society, check to see if there is a special interest group (SIG) that can give you assistance.

Whether you can get a demonstration or not, you will still have to sit down in front of a computer in the store, boot up the program, and experiment with the program yourself. Bring along sample data or problems of the sort you plan to solve. Try to determine whether the program meets all your needs, or will have to be modified to suit your particular requirements, by addressing those specific items during your testing of the program.

Actually testing a business program will take some time, particularly if you have to learn how to operate the program without assistance. Make arrangements with the store to do your testing during a slow period. You will get more assistance from the store and salespeople if you show some consideration for them.

Once you have satisfied yourself that you have found the business package that meets all your needs, and you are ready to buy it, deal with the store that gave you the most help and assistance with that program. Don't send off for a mail order copy just to save a few dollars. It doesn't take long for the local stores to realize you are taking advantage of their time and equipment by repeatedly evaluating software or playing games without ever making a purchase. When that happens, you will find yourself without a source of help.

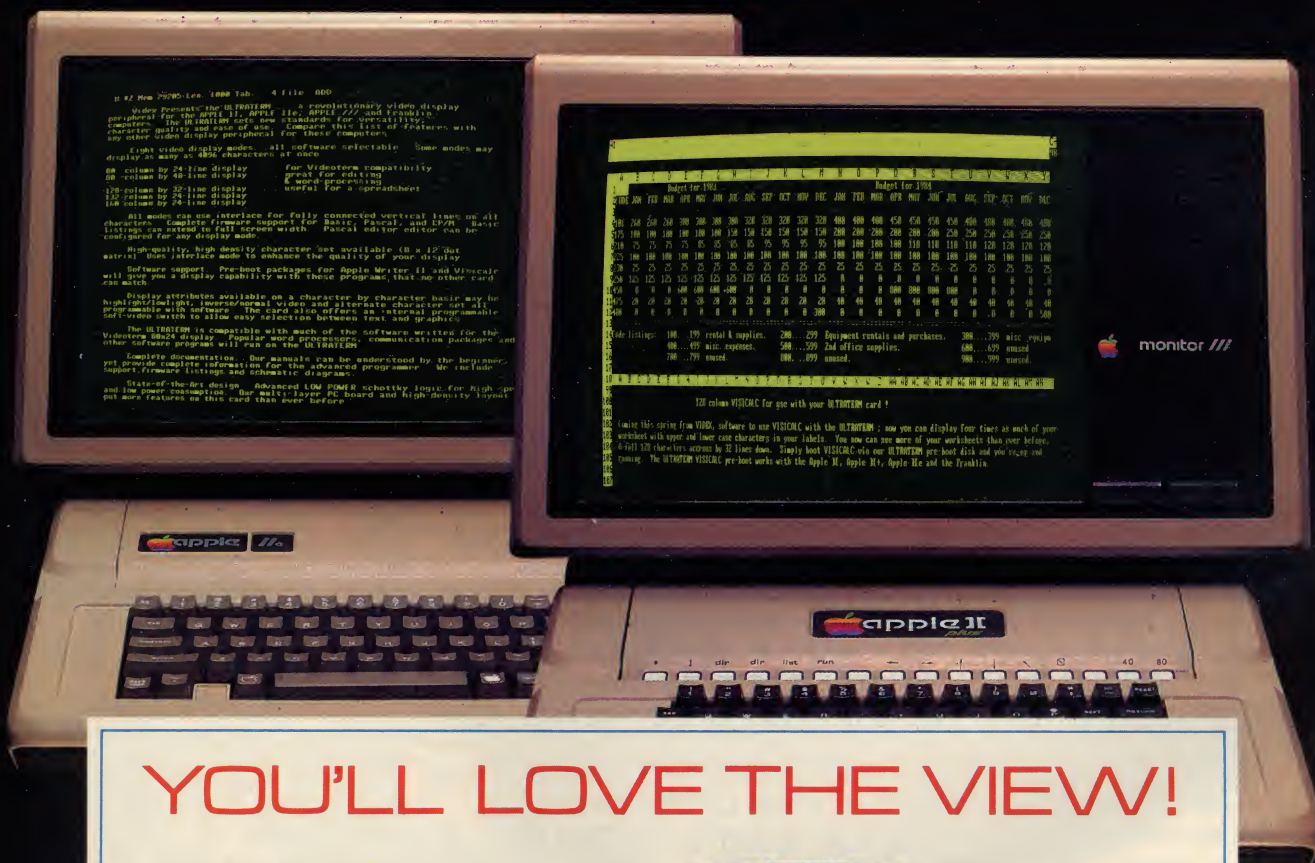
I have seen people return software (and hardware) to a local store and immediately walk out with a replacement for the defective item. That kind of service is worth more than a few dollars, and is certainly better than waiting weeks for a replacement.

I still have a cassette copy of a game that I bought mail order from the manufacturer, which I returned because my Pet wouldn't load it. The same tape was sent back to me with a note stating that it loaded on their machines, so it had to be fine and there was probably something wrong with my tape recorder. Since all the other commercial software I had purchased loaded fine on my Pet, I wasn't about to change my cassette playback head alignment. The program continues to gather dust. This incident occurred several years ago, but it still serves as a reminder of what can happen if you have problems with software.

Finding the right business software requires time and effort. Unless you are willing to devote a great deal of both to your search, you will wind up with either an expensive dust collector, or the need to buy another program to accomplish the functions not covered by the first. □



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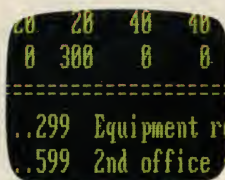


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CIRCLE 112 ON READER SERVICE CARD

What Is CP/M?

Operating systems, like programming languages, rouse almost religious fervour in their opponents and their supporters alike. CP/M (Control Program/Microcomputers), distributed by Digital Research, Inc., has attracted its share of praise and abuse—perhaps more than its share.

It is time to take a cooler look at both its merits (which are considerable) and its undeniable weaknesses, and to examine how well it serves the needs of microcomputer users today. To these users, two issues are of prime importance: quality of the human interface and portability of programs.

By the “human interface” I mean the characteristics which help or obstruct the user in his attempts to make his computer perform useful work for him. “Portability” covers those characteristics which allow a particular program to run on any computer of the same general type, regardless of the brand of terminal or printer attached to the computer.

What Is an Operating System?

An operating system is a program that is resident in the main memory of the computer from the time the system is “brought up” to the time it is switched off. It has two main purposes:

- To provide a standard method for writers of application programs to request services such as “Display a message on the screen,” “Send a character to the printer,” “read a sector from the disk and load it into memory,” and so on. Allocation of disk space to programs and user data files forms an important part of these services.

- To interpret and execute commands given by the user via the keyboard, such as “Load and run WordStar,” or delete the file called FOOBAR from the disk, or “Tell me how much free disk space remains on the B drive.” If anything goes wrong with one of these operations (e.g., a disk sector is found to be unreadable),

Chris Terry

the user must be informed by an “error message.”

The services provided to the application programmer are vital to the issue of portability but should be totally invisible to the user of an application program. The command processor should make life as easy as possible for the user—commands should be simple and clear, and error messages should be as explicit and helpful as possible.

In the world of the big IBM mainframes, the resident programs (OS/370) constitute an Obstacle System that even

Continuity between the versions constitutes one of the great strengths of CP/M.

programmers have trouble learning; in the DEC world, Unix was *designed* as an Operating System—but even that, good as it is, gives trouble to the layman on occasion.

In the microcomputer world, where a large portion of users are not programmers and do not wish to be, we are only now, eight years after the birth of the personal computer, starting to see operating systems designed from the very start with the lay user in mind.

The CP/M Family

CP/M is, in 1983, the generic name of a family of operating systems for microcomputers of various types, all based on the original version (1.3) which was written for 8080/Z80-based systems. The current members of the family are: CP/M-80 version 2.2 and CP/M Plus for 8080/Z80-based systems; CP/M-86 for computers

using the Intel 8086 or 8088 (such as the IBM PC); CP/M-68K for systems based on the Motorola 68000; and CP/M-Z8K for systems using the Zilog Z8000.

Functionally, the later members of the family include and build on the kernel provided by the original CP/M-80 version 1.3, preserving the actual services provided in the older members and maintaining the format of service requests. Thus, application programs written to run under CP/M 1.3 will probably also run under CP/M Plus, provided that the application programmer conformed strictly to the format specified for service requests.

From the user's point of view, there is very little difference in the commands provided by versions 1.3, 1.4, and 2.2 of CP/M-80; CP/M Plus, however, adds a large number of facilities and at the detailed level some commands work rather differently.

This continuity between the versions constitutes one of the great strengths of CP/M. Within a few months of the time when CP/M 1.3 first appeared on the market there was a significant body of software that utilized it, most of which could be run without change on version 1.4. It was for a time the only disk operating system available; when rivals started to appear, CP/M remained for some time the only relocatable operating system capable of accommodating any memory size from 16K to 64K. It was also the only system that provided dynamic allocation of disk space, allowing a file to be expanded and contracted incrementally without the user having to specify the file size; and it was the only one in which the I/O routines, both for disk and peripherals, formed a separate block for which source code was provided and which could be modified by the end user.

It was these features, coupled with the reliability of the system, which led Lifeboat Associates to adopt it as their standard. That adoption, in turn, led to CP/M becoming a de facto standard throughout

the 8-bit world, especially when version 2.2 removed some of the minor irritations and transferred the disk space definition tables out of the kernel into the I/O area, where they could be customized to take advantage of emerging high-density, double-sided, and hard disk technologies.

Is CP/M Really an Operating System?

Few of the early personal computing pioneers ever raised this question. CP/M was the most flexible system available and served their needs well; they were so glad to be free of cassette-based systems that they were quite prepared to work around the minor inconveniences imposed by a compact system designed to operate in as little as 16K. The sharply dropping price of memory, however, made it feasible to construct quite large software systems and brought into the microworld software designers accustomed to elaborate time-sharing systems such as Unix or the Xerox CP-V. To them, the file-size limitations and the awkwardness attending the creation of multi-volume data sets under CP/M were, if not intolerable, at least a constant source of irritation.

They sneered that CP/M was not an "operating system," but "nothing more than a rather limited file manager." Their

irritation was understandable, but in decrying CP/M they failed to take into account the solid virtues of the system—reliability and flexibility. And in complaining about its faults, they ignored the need to support what was by now a vast body of software that ran smoothly and was easily transportable from one machine to another, regardless of what peripherals were attached to the system.

The New Generation

In 16-bit machines it is not uncommon to find 128K, 256K, or even 512K of main memory, whereas in the early days the

mere thought of 64K would have sent most people scurrying to hide their credit cards. Although 16-bit programs are, function for function, considerably larger than their 8-bit equivalents, the availability of inexpensive memory space has stimulated many changes to the new generation of CP/M family members. Chief among these are the increase of file sizes (under CP/M Plus a file may be as long as 32Mb and a drive unit may hold 512Mb), concomitant improvements in the handling of multi-volume data sets, enormous improvement in the explicitness and helpfulness of error messages, and the addition of many new facilities not previously available because of the need to keep the resident system compact.

Concurrent CP/M-86 provides multi-tasking capability (e.g., you can watch error messages from a compiler on one console and simultaneously correct the source with an editor on another), though you need 256K just to boot the system, and 320K to do anything useful. The need to port CP/M to a 68000 environment required that the system be rewritten in a high-level language; C was chosen, and a C compiler is supplied with CP/M-68K and CP/M-Z8K. As many as possible of the improvements were also incorporated into CP/M Plus for 8080/Z80 machines,



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What Is CP/M?, continued...

on which memory bank switching now provides space for buffers, hash tables, and other features that result in a 4 to 10 times speed increase over version 2.2.

Portability Is Still the Issue

The arrival of all the new members of the CP/M family and the lack of standardization in disk formats have made program portability a matter to be looked into most carefully. It is no longer enough to ask "Does it run under CP/M?" One must also ask "Under which CP/M?" Clearly, a program written for an 8-bit machine will not run on a 16-bit machine unless source code is supplied.

Three types of incompatibility may be encountered: configuration, translation, and porting. Configuration incompatibility is generally the result of the profusion of disk formats. Even under CP/M 2.2, an Osborne 1 machine cannot read 5-1/4" disks made for a Morrow Microdecision. This kind of incompatibility becomes a logistical problem for the vendor or distributor, who may have to supply a popular program in as many as 50 different 8" and 5-1/4" formats.

Translation incompatibility is the result of attempts to translate an 8080 assembly language program to 8086 assembly language. A program to do the bulk of the

translation exists, but even when it has completed its processing, some cleanup and optimization must usually be done manually. Thus, an application program that runs beautifully on a Z80 machine may develop a few subtle quirks after translation for use on an 8086/8088 machine.

***It is no longer enough
to ask "Does it run
under CP/M?" One
must also ask "Under
which CP/M?"***

Also, reports seem to indicate that CP/M-86 for the IBM PC was modified by IBM so that some commands and service requests behave in a slightly different manner from the corresponding commands and requests in the standard, user-configurable CP/M-86 supplied by Digital Research. This, together with the desire to make CP/M more competitive with PC-DOS, the IBM operating system for the PC, has resulted in a decision by Digital Research, Inc. to drop the price

of CP/M-86 for the PC from \$240 to \$60 and to supply it direct, instead of through IBM.

Porting incompatibility results when the source code for a high-level language program is compiled by two different compilers which do not interpret the code in exactly the same way. Digital Research, Inc., is attempting to eliminate difficulties of this kind by supplying a C compiler with CP/M-86, CP/M-68K, and CP/M-Z8K.

Conclusion

The large improvements in performance and facilities provided by CP/M Plus, and the simplicity and reliability of CP/M 2.2, are likely to leave this system dominant in the 8-bit single-user market. There are a few rival systems (Oasis and I/OS, among others), but they have neither the vast existing software base supported by CP/M nor the prestige and marketing facilities of Digital Research, Inc.

In the 16-bit market, there are many more rivals, notably Unix which at the moment appears to be leading the field in systems based on the Motorola 68000. Nevertheless, many application packages are being ported from the 8-bit world to the 16-bit world to run under CP/M-86. □

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Selecting & Buying Educational Software

Selecting and buying educational software is no picnic. It is a problem faced by both educators and parents to which there are no easy solutions.

Some educators have access to local and regional centers and can see a wide variety of software at these centers, however, it is a rare center that has one of everything for every computer. And unfortunately, good as these centers are in New York, Minnesota, Florida, etc., they serve only a fraction of the country. Hence, to a large extent, educators face the same situation as do parents, namely buying software sight unseen.

So, what do you do? First and foremost, you must start with a set of criteria against which to judge a package. While it would be desirable to see a package and apply these criteria to it, most of the time you will have to judge the merits of a package from reviews, word of mouth, or manufacturer-supplied information.

Criteria for Educational Software

- **Educational Soundness.** In a sense, it goes without saying that a package must be educationally sound. Naturally, every manufacturer claims this of their offerings. However, the bitter truth is that some packages are a computer programmer's idea of what ought to be, rather than something that has been tested and validated.

Many computer people (and others) have the idea that drill and practice is no good because it is rather boring. Sure, it may be boring, but Patrick Suppes proved beyond any reasonable doubt that "math strands," a hard-core drill and practice approach is incredibly

effective with both underprivileged and gifted children and most others in between. That doesn't necessarily mean that all drill and practice is good—some of it is abysmally bad for other reasons—but it does indicate that some popular notions of what is good and bad should be questioned.

The real issue of educational soundness is probably best determined by how (and whether) a package has been tested and validated. If an author claims that his kids like the programs, that isn't testing, that's a sales pitch. Even testing in one class by the author is suspect because the author imparts an enthusiasm to using a package that others might not. A school district-wide test is good; one over several districts is better.

- **Appropriateness.** Is a package appropriate for the age and grade level of the user? This is not always easy to answer. Depending upon the state and school district, the same subject may be taught at widely different points in the curriculum. For example, physics may be taught in 10th, 11th, and 12th grade in three adjacent states.

A more serious problem is that approaches to teaching a given subject differ from state to state and from region to region. Today, about 60% of the schools in the country use the "new math" while the balance use a more traditional approach. Getting the "wrong" one for your child or class could lead to confusion and frustration.

David H. Ahl

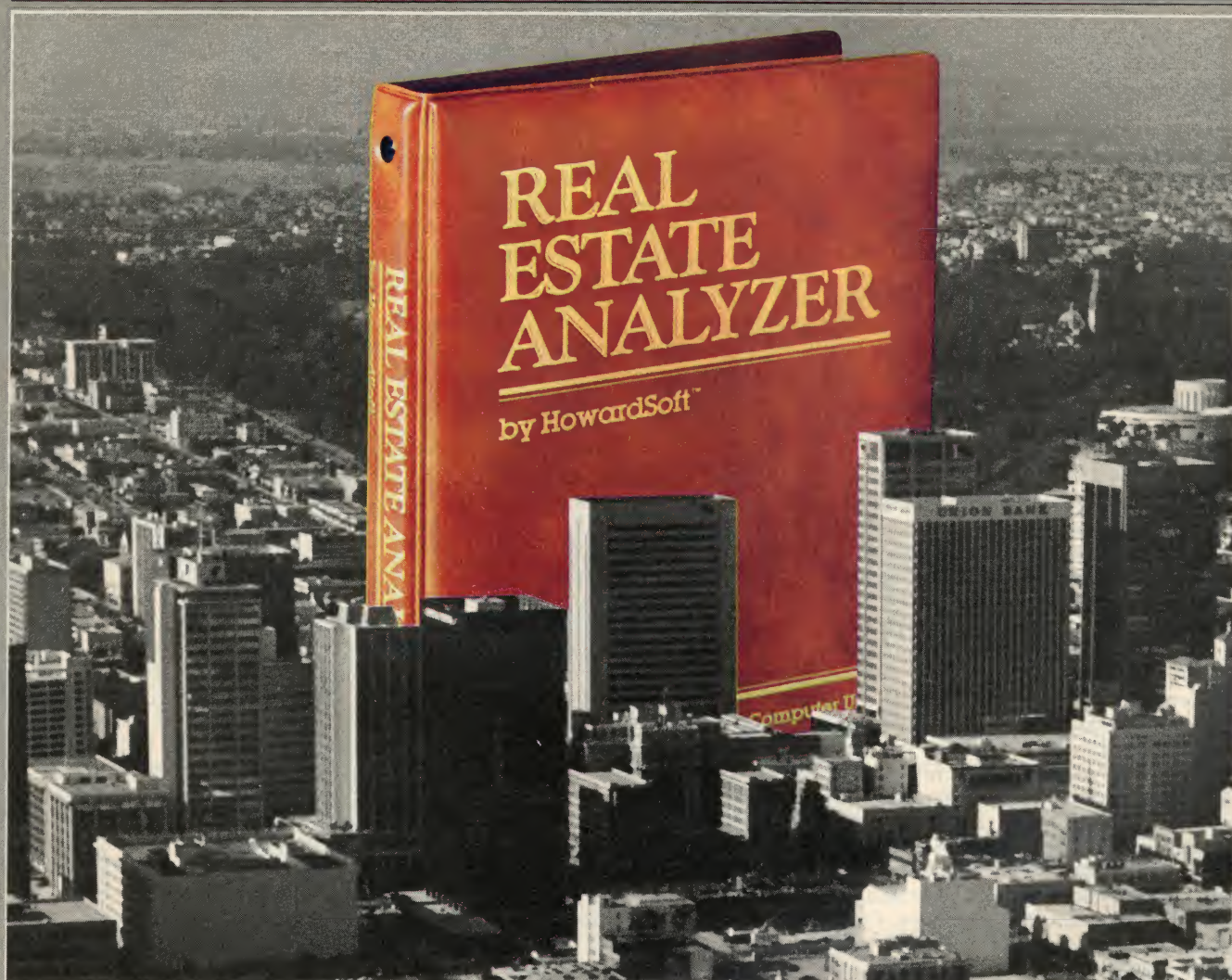
- **Challenge and Progress.** A good educational package should provide a reasonable challenge to users. "Reasonable" means 10% to 20% beyond what the child can currently do. If a package is too easy it will lead to boredom and restlessness. A package that is too difficult will lead to frustration, anger, and possibly even loss of self-respect.

However, the real challenge to the program designer is devising a way to keep the material just a step or two beyond the user as he progresses through it. All too often, packages progress too slowly and become boring (one reading comprehension package is a disaster in this regard). Or they progress too quickly and become frustrating (a vocabulary package we got last week seems to jump from 3rd grade to 7th to college in three steps).

- **Motivation and Reward.** The computer by itself is highly motivational, but if a package doesn't inject some additional motivation and reward, it leaves much to be desired. By motivation, we don't mean printing "very good" on the screen after each correct answer—that gets old fast. Rather, the opportunity to play a game or see a short bit of animation (such as the intermission in Pac-Man) is probably desirable. The Sterling Swift math series is exemplary in this regard with a simple animated stick figure and the occasional use (but not overuse) of the child's name.

Rewards in a program should be granted for the correct answer and encouragement given after incorrect or partially correct answers. In one program, a dragon slays the good guy if the answer is incorrect; unfortunately this is

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Educational Software, continued...

much more visually exciting than when the dragon is slain. As a result, most kids deliberately answer incorrectly so they can see the more interesting scene.

Worst of all are programs that are insulting or sarcastic to the user after an incorrect response. Any program that says to me, "try again, dummy" immediately goes into the trash heap without further ado.

- **Correctness.** You may be saying to yourself, "What does he mean by that?" We expect programs, like books, to be correct. But unlike books, programs are rarely passed by a battery of proof-readers and editors. Thus, they have mistakes. Some are small mistakes, a misspelled word here or there, faulty grammar, or incorrect capitalization. But some programs have much worse flaws.

For review, we recently received a vocabulary program with three incorrect word definitions, a spelling program with two spelling words misspelled, and a science program in which two input quantities for a simulation were reversed. Perhaps the worst example of this is the capitalization program from Instant Software that uses only upper case letters.

- **Compatibility with Your System.** Needless to say, you would not buy an Apple disk for a TRS-80, and you would check the memory requirements of a piece of software before buying it. But there is more to it than that. Some programs really want color; indeed it is quite impossible to run Color Shape Match on a monochrome monitor. One group of programs from EduTech requires paddle controllers and a Pasco

interface box. Still other programs require a joystick, 80-column card, lower case chip, or some other device that you may not have. Be sure to look into this before buying a program just because it "fits" on your computer; maybe it doesn't.

- **Instructions and Handholding.** We have seen educational packages recently that have no instructions whatsoever except those on the disk, others that simply repeat what is on the disk, others that are thorough and go way beyond what is on the disk, and still others that are totally incomprehensible. They run the gamut. Some are colorful, quality print jobs with full-color screen illustrations while some are typed on a bad typewriter and reproduced on an even worse copier.

We favor instructions that get you into using the program as quickly as possible but that also have additional background information for further exploration of the topic. The booklets produced for the old Huntington Computer Project programs were outstanding. Each program had three booklets, a student workbook which got into using the program by the second page, a teacher guide (sample runs, answers to problems in the student workbooks), and a resource handbook (sometimes as many as 64 pages of background reading, assumptions in the program, and complete program listings). Unfortunately, no one today is producing material this good. Too bad.

Another important aspect of the instructions is how much they expect of the parent or teacher. Few educational packages can (or should) be run by the

student with no outside guidance. On the other hand, once a program is started, it should not need the constant attention of an adult. One recent disaster aimed at kids, preschool to Grade 2, arrived here. The student prompts were mostly large pictures or short words, however, between each two or three screens, several lines of instructions were given, e.g., "Press esc to choose the next item and then return to proceed." Bad news.

Sources of Information

Naturally if you are an educator serviced by a regional, county-wide, or district center, that is the place to turn first. But few of us are in such an enviable position; where do we turn?

The best bet is objective, in-depth reviews of educational software packages. Unfortunately, many magazines run superficial reviews just so they can say they are covering the educational market or so they can attract advertising from manufacturers of educational software. Often, these reviews are written from a press release supplied by the manufacturer or are "reviews" provided by the author or manufacturer.

Reviews written from a press release or by a manufacturer are generally easy to detect as they are full of superlatives and rarely, if ever, point out anything negative. Other reviews are submitted to a magazine by someone trying to justify his purchase of a particular package. These are sometimes difficult to detect but, in general, tend to be full of personal experiences and point out how clever the reviewer was for buying a particular package.

There are several magazines and other sources of educational software reviews that have established themselves as running in-depth reviews by objective reviewers. Below is a list of publications which run good, solid reviews. Unfortunately, it is an incomplete list and some publications which deserve to be on it are not simply because we are not aware of them or because we do not get their publications. In any event, it is a good list with which to start:

- **School Microwave Reviews** and **School Microwave Directory.** In our opinion, this is the best source of objective reviews. Over 50 packages are reviewed in each quarterly issue of reviews and the twice-a-year *Directory* has capsule descriptions of over 2000 packages. A subscription to *Reviews* costs \$45 per year and the *Directory* costs \$25. Write Dresden Associates, P.O. Box 246, Dresden, ME 04342.

- **Courseware Report Card.** Issued as looseleaf pages for a three-ring binder, the *Report Card* is published five times a year in two editions, elementary (K-6)



THE HEAD OF THE CLASS



Give your child the thinking tools that stand in a class by themselves: programs for your home from Computer-Advanced Ideas.

For The Fun Of It

As professional educators and programmers we've been proving for over a decade that motivated learners do best. Featuring full-color graphics, our animated learning games are fun. They talk like a friend, play like a teammate and teach like a tutor. And they stimulate eager young minds.

Partners In Learning

CAI programs come with a library of knowledge for your child to explore. But that's just the beginning. They also feature a unique authoring system that lets you create lessons on any subject, tailoring the program to your child's needs. No knowledge of computers is required. Our programs make sense to *people* — from 4 to 94 — and grow right along with your child.

A Success In Schools

Over 1800 school districts have chosen CAI programs to teach essential vocabulary and logic skills in a full range of topics. Our products get recognition — because they work.

Head Start

Your child's future begins with opportunities you create at home. Choosing resources that are stimulating, challenging and fun can be one of the best decisions you make. Ask your computer retailer for a demonstration of CAI programs and see for yourself how enjoyable a good education can be.



**Computer
Advanced
Ideas**



Bringing Ideas Home

1442A Walnut Street, Suite 341
Berkeley, CA 94709 (415) 526-9100

For the Apple II/IIe

Educational Software, continued...

and secondary (7-12). Each "issue" has 20-25 in-depth reviews, frequently with screen displays. A subscription to either edition costs \$49.50; you can get both for \$95. Write Courseware Report Card, 150 West Carob St., Compton, CA 90220.

- The Book Company, 11223 S. Hindry Ave., Los Angeles, CA 90045 publishes two excellent directories to Apple and Atari software. The books include reviews of nearly every software package for each computer as of the end of 1982, and they don't pull any punches. Each book is \$19.95.

- Magazines. As mentioned above, not every magazine has objective reviews. Some of those that do include:

Electronic Learning

902 Sylvan Ave.

Englewood Cliffs, NJ 07632

\$19 for 8 issues/year

The Computing Teacher

Dept. of Computer Science

Univ. of Oregon

Eugene, OR 97403

\$14.50 for 9 issues/year

Classroom Computer News

341 Mt. Auburn St.

Watertown, MA 02172

\$19.95 for 6 issues per year

Educational Computer

P.O. Box 535

Cupertino, CA 95015

\$15 for 6 issues per year

(The Jan/Feb '83 issue had an excellent article, on testing courseware and a list of sources of critical evaluations. Single copy \$3.00)

Of the major computing magazines, only two run a significant number of educational reviews, *Softalk* and *Creative Computing*. *Softalk* runs about 60 educational reviews per year. Typically, *Creative* runs 25-30 reviews in April and October and a few in most other issues for a total of 100 or so per year.

How To Buy

You can buy software in retail stores or by mail. Purchasing from a retail store has the advantage that you can usually see what you are buying before taking it away. Also, if it is unsatisfactory, you can frequently (but not always) return it to the store from which you purchased it.

The major disadvantage in buying from a store is that most stores cannot justify carrying more than a half dozen lines of educational software at most. Yet both the Dresden and Scholastic directories list over 200 manufacturers of educational software and more are

entering the market every day.

Hence, if you want to buy a package from any of the over 194 manufacturers not handled by your local computer emporium, mail order is your only route. Since this is not a primer on mail order buying, we will not repeat the many "rules" we have mentioned in other articles.

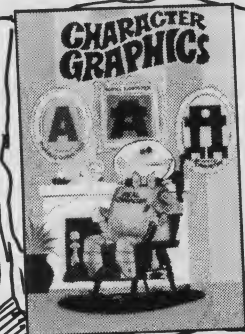
In general, we have found educational software publishers willing to go well beyond the call of duty to satisfy their customers. However, we admonish you not to push too hard for extras and personal service; remember, these publishers are trying to make a living and if they clear \$2 or \$3 on a package, they are lucky. Thus, ten minutes of personal service can turn a profit into a loss, and if this happens too often, there is one less publisher in the business.

And Now For the Reviews

Well, not really. Much as we would like to print hundreds of educational reviews in this guide, we just don't have the space. We have selected some of the best packages to describe in the following section. However, for a more comprehensive view, you can order the October 1982 and April 1982 and 1983 issues of *Creative Computing* for the package price of just \$10 postpaid. □

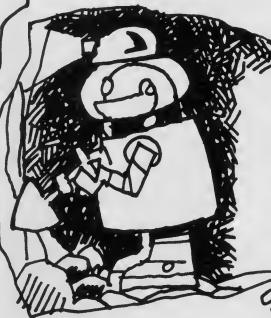
DIGGING AROUND FOR SOME NEW TUTORIALS?

Here are 3 new ones from EDUCATIONAL SOFTWARE inc:



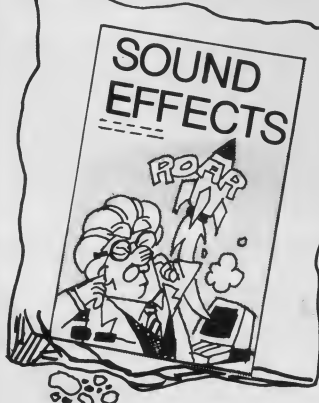
TRICKY TUTORIAL #8

Learn to take the shapes of the letters and numbers on the keyboard and change them to anything you want. Special fonts and creatures that move are all explained in this huge Tutorial. We'll tell you how a shape is stored in memory, animate several shapes, then give you a game using all the techniques. Includes an editor that animates your characters as a preview. 16K Tape / 32K Disk \$29.95



TRICKY TUTORIAL #9

Learn to use Graphics modes 9, 10 and 11 that your BASIC Manual forgot to tell you about! There are 16 shades or 9 colors awaiting you within the machine. Prototype will take you through many examples while Professor Von Chip explains how they were done. Includes three dimensional shapes and digitized pictures. 16K Tape / 32K Disk \$29.95



TRICKY TUTORIAL #10

Over the years, Professor Von Chip has acquired a large collection of sound effects on his ATARI that are unusual to say the least! We offer them here plus an ample amount of explanations, utilities and graphics to save you endless hours. Have fun while learning! 16K Tape / 32K Disk \$29.95



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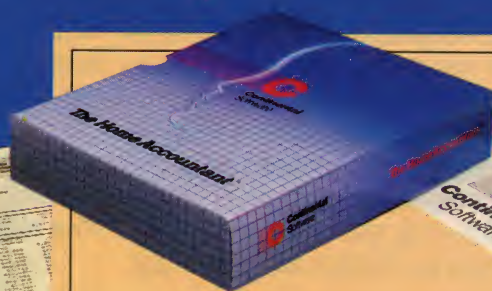
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*The Home AccountantTM is available for the Apple II/IBM Personal Computer/Atari 400/800 Computers/Osborne/TRS 80 Model III/Commodore VIC 64. The actual budget capacities will vary with each computer.



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CIRCLE 119 ON READER SERVICE CARD

IF YOU'RE CONFUSED PERSONAL COMPUTER,

At this moment, there are no less than 50 personal computers on the market. And more are being introduced every day.

On one hand, having all those options is a good thing. On the other, it can make picking the right one pretty difficult.



*Computers come in two parts.
You have to buy both.*

We'd like to help. So here are a few suggestions about how to buy the computer that's right for you.

Computers come in two parts.

One part is the "hardware," which is the machinery itself. The other is the "software," or a program, as it's sometimes called.

Software is the part that tells the computer what to do, the way a driver tells a car what to do.

Without software, a computer can't do anything.

And vice versa.

You have to buy both.

Buy the software first.

Since the reason you're buying a computer is to get the capability the software gives you (remember, it's the software that knows how to get things done), it makes good sense to pick the software first.

Start by making a list of the things you want to use the computer for. It can include almost anything—any kind of inventory, filing, accounting, graphics, reporting, record-keeping, analysis—you name it and there's probably a software program that does it.

Next, take the list into a computer store and ask the salesperson to give you a demonstration of the program, or programs, that will do the things you want.

Even though you'll need a computer for the software demonstration,

keep in mind the computer is just a vehicle. The software is the driver. And once you've decided on the software, picking out the rest of the computer system will be much easier.

The simpler the better.

Look for software that's easy to learn, easy to use, and that does the job in the simplest way possible.

Good personal software should be, as the computer people say, "friendly." Meaning that it helps you do what you have to do without getting in the way.



Meaning there are no complicated routines to follow to perform a simple task. And no programming language to learn.

Some people, however, will tell you that software has to be complicated to be powerful.

Nothing could be farther from the truth. Because in order for a program to appear simple to you on the outside, it has to be extremely complex on the inside.

ABOUT BUYING A HERE'S SOME HELP

Good software keeps the complications in the computer, where they belong. And keeps the capability at your fingertips. It's that simple.

You simply have to see for yourself.

You can read any number of interesting books and magazines about personal computers. You can ask friends who have them. You can look at all the sales literature you can get your hands on. And you should do all those things before you decide to buy.

But as helpful as all that can be, there really is no substitute for a real, live demonstration.

When you do go out shopping, we recommend you take a look at the PFS® Family of Software.

The PFS family is designed the way we think all software should be: simple, straightforward and powerful.

Currently, three products make up the family. PFS:FILE, PFS:REPORT and PFS:GRAPH, with more programs on the way. Here's a little more about each of them.

PFS:FILE. The simplest way to get organized.

Basically, FILE works like a paper filing system, without the paper. So you can record, file, retrieve and review information in a fraction of the time it takes with a conventional filing system.

FILE lets you arrange your information in "forms" you design yourself. So you can get at and really use your information in ways never before possible.

What's more, FILE lets you change the original form without having to redo the information on it.

PFS:REPORT. Making the most of your information.

REPORT summarizes the information on your forms so you can use it to analyze, plan and make better-informed decisions.

With REPORT, you get presentation-quality reports—sorted, calculated, formatted and printed—automatically, in seconds.

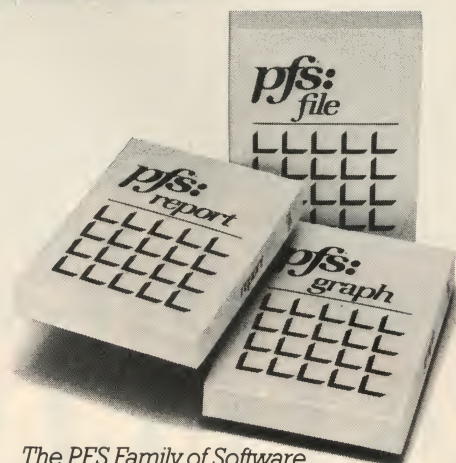
PFS:GRAPH. Instant pictures.

GRAPH gives you presentation quality bar charts, line graphs, and pie charts, in black and white or color, on paper or the computer screen. To get a clearer picture of things and spot trends instantly, you simply enter your information and specify the kind of graph or chart you want. GRAPH does the rest.

You can also mix and match line and bar graphs, or even stack or compare up to four bar graphs simultaneously.

And GRAPH will work with PFS:FILE, VisiCalc® files, or data entered directly into the computer.

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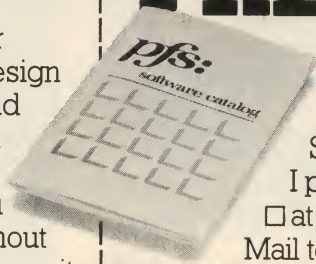
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Learning Can Be Fun

Micro Mother Goose

So your child watches Ernie and Oscar on *Sesame Street* but thinks that your games on the Apple look like great fun too. *Micro Mother Goose* may be just the thing for you and your child.

Here is a disk with nine Mother Goose rhymes (with full color and sound) along with three games. But wait! There is more to it than that. When you open the package you will find six colored Mother Goose stickers, great for books, computers, and TV monitors.



There is a colorful 11" x 17" "Micro Do's and Don'ts" poster, and you will also find a 16-page manual that describes the contents of the disk and discusses "family computing."

We are told in the literature that the disk is "kid tested and child-friendly." It is, indeed. It is only necessary to use two keys. The space bar selects items on the pictorial menu, and the RETURN key starts a program running.

Each of the nine nursery rhymes starts with a colorful graphic on the

David H. Ahl

screen. Next, the words to the rhyme appear. After that, the tune of the rhyme plays through the Apple speaker.

Many times in these pages, we have recommended that an external speaker be substituted for the internal Apple speaker. At the risk of being redundant, we again recommend that substitution. You will be amazed at the difference a \$7.95 extension speaker from Radio Shack makes in the sound of your Apple. Played through such a speaker, these nursery rhymes will have the whole family singing along in no time flat.

Two of the games on the disk are based on "big people games." "London Bridge-Out!" is a slowed down version of *Break-Out*. It starts with two rows of ten bricks each and a wonderful spinning ball (you can even see the spin). The movement is slow enough that even a three-year-old will have no trouble hitting the ball two or three times with the large paddle at the bottom of the screen. However, on each level of the game, there are more bricks and the ball moves slightly faster. At higher levels of play, the game is a challenge for even the most accomplished *Break-Out* player.

The second game, "Splat!" is similar to *Kaboom* or *Popcorn*. You have a basket at the bottom of the screen which must be moved back and forth to collect six eggs which are dropped from the top. When you have successfully caught a

half-dozen eggs, they hatch, and little chicks emerge. The game ends after 100 eggs have fallen. The number of eggs you have successfully caught and hatched appears as your final score on the top of the wall.

The third game, "Lamb Scramb!" is the easiest to play. The object is to get all of Mary's stray lambs safely through the hedge at the left side of the screen and back to Mary. The lambs move around on the right side of the screen. When one is parallel with a hedge opening, you press the button on paddle 0 and the lamb scoots over to Mary. If you misjudged the lamb's position, it simply bonks its head, bounces back, and continues its up and down motion.

If all three of your lambs make it through the hedge, you are a winner, and Mary's lamb song plays as her garden springs up all over the screen.

creative computing

SOFTWARE PROFILE

Name: Micro Mother Goose

Type: Games and graphics

Author: Sina Pettis

System: 48K Apple

Format: Disk

Summary: Games and nursery rhymes for pre-schoolers

Price: \$39.95

Manufacturer:

Software Productions Inc.
2357 Southway Dr.
Columbus, OH 43221
(614) 486-3563

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An advanced binder bonds oxides to the base material preventing time and money-wasting dropouts. Calendering then smooths the surface for a read/write signal that stays

clear and accurate. And lubricants reduce friction between head and disk for a longer media and head life. To house it, we then constructed a new jacket heat-resistant to 140° F to withstand drive heat without warp or wear. And created the floppy disk that leads the industry in error-free performance and durability.

All industry standards exist to assure reliable performance. The Gold Standard expresses a higher aim: perfection.



maxell
IT'S WORTH IT.

CIRCLE 121 ON READER SERVICE CARD

Learning Can Be Fun, continued...

All in all, *Micro Mother Goose* is a delightful, wholesome disk of games and nursery rhymes. The graphics are excellent, the packing professional, and the games fun. We also applaud Software Productions for making this a non-protected disk so you can back it up without fear of losing the original. While this makes it easy for pirates to copy, we think that most parents will want to get the stickers, poster, and instruction book and thus will be willing to pay for the original product. Sina Pettis of Software Productions promises us more "classic family software" packages, and we are looking forward to them.

PDI Preschool Library

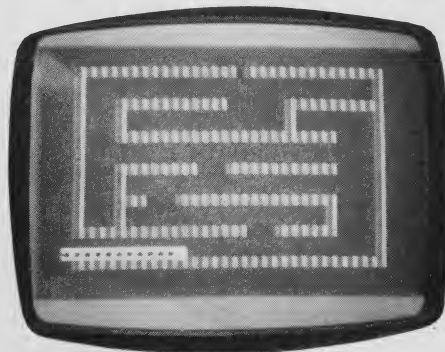
The *PDI Preschool Library* consists of a set of four tape cassettes (or disks and audio cassettes) and a 12-page booklet. Its purpose is "to help three-to six-year olds develop certain critical skills that will be needed when they start school." These skills include shape, number, and letter recognition; the concept of same and different; directional concepts; listening; and hand-eye coordination.

The four titles in the package are: Preschool IQ Builder 1 and 2, Sammy and

the Sea Serpent, and The Adventures of Oswald.

Typical of the 16 programs in the IQ Builder series is "Same and Different." Two figures appear on the screen. If they are the same, the joystick must be pushed forward; if they are different, it is pulled back. Reinforcement, in the form of a cute song, is given to correct responses. Pushing the joystick button will display the score to that point.

"Sammy" and "Oswald" are interactive stories. Sammy is a sea serpent who gets separated from his parents in a



stormy sea. He is thrown onto the land and wants to return to the sea. By listening to the narrated story and following the directions, the player can move Sammy with the joystick through a town, a garden, and various other places, until he eventually returns to the sea.

The narration is excellent and employs appropriate music to go along with the computer images. The animation is simple, yet compelling. Children get very wrapped up in trying to help Sammy and are particularly anxious when he shrinks from lack of food. Fortunately, several obliging bugs, which can be caught by Sammy under the guidance of the player, flutter onto the screen.

The booklet suggests appropriate

creative computing SOFTWARE PROFILE

Name: PDI Preschool Library

Type: Skill Building

Authors: John Victor, et al.

System: 16K Atari

Format: Cassette or Disk

Language: Basic

Summary: Stories and games to build basic skills

Price: Cassette \$59.95; Disk \$89.95

Manufacturer:

Program Design, Inc.

11 Adar Court

Greenwich, CT 06830

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REVIEWS WRITTEN BY EARL SAVAGE, APPEARING IN JAN. 83 *MICRO* AND MARCH 83 *RADIO ELECTRONICS* INCLUDE:

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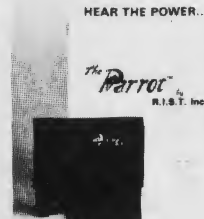
BEST OF ALL THE PARROTS ARE AFFORDABLE. SO GIVE YOUR COMPUTER THE VOICE OF THE FUTURE...TODAY!



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ENCLOSED IS _____

CIRCLE 122 ON READER SERVICE CARD

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Edited by
Paul Grosjean

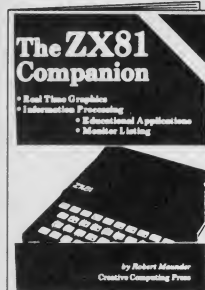
This new book is a must for all Sinclair and Timex Sinclair 1000 owners! Taken from the first six issues of *Sync* magazine, *The Best of Sync* covers: Games, Math and Math Graphics, Software Programming Techniques,

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By Bob Maunder



The ZX81 Companion follows the same format as the very popular *ZX80 Companion*, and assists the ZX81 or Timex Sinclair 1000 user in four applications areas: graphics, information retrieval, education and games. This practical guide contains scores of fully documented short routines plus complete programs and a disassembled listing of the ZX81 ROM Monitor. "Thoughtfully written, detailed, and illustrated with meaningful programs."—MUSE

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By Tim Hartnell

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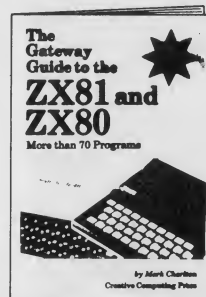


This informative volume for the new ZX81 or Timex Sinclair 1000 user contains more than 80 programs to help the reader get the most from his Sinclair computer. Game programs include Checkers, Alien Implosers, Blastermind, Moon Lander, Break-out, Star Burst and Derby Day. The book also shows programs for cascading sine waves, plotting graphs and tables, data sorting, equation solving, plus the use of PLOT, SCROLL, PRINT, TAB, PEEK, POKE and much more!

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By Mark Charlton



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By Sally Larsen

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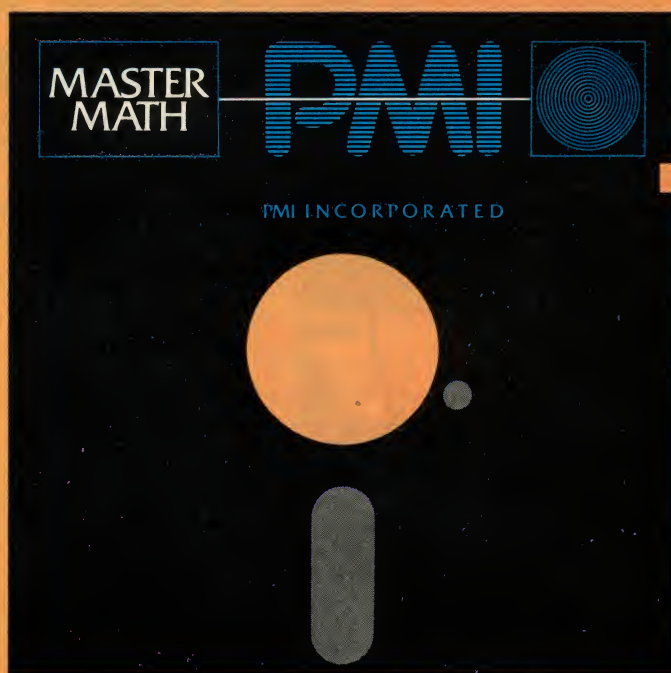
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CIRCLE 124 ON READER SERVICE CARD

Learning Can Be Fun, continued...

reinforcement activities for you and your child that will expand on the concepts presented on the computer. In summary, we found the *PDI Preschool Library* a valuable and highly motivational tool for helping build important intellectual skills.

Early Elementary Disk I

Early Elementary Disk I is a series of four programs designed for pre-school through the second grade. The programs include "Count the Shapes," "Color Match," "Number Drill," and "Shape Match." In addition, the disk includes a teacher management file which allows the programs to be personalized and tailored to the age and ability of the students.

When the disk is loaded, a menu which allows the user to select any one of the four drill programs or the teacher management file appears. Upon selecting a drill program, some simple instructions are presented followed by a screen which asks the student to type in his name. Our experience with young children is that they are likely to type just

about anything. Unfortunately, the error trapping routines in the program are not designed to catch garbage responses and so a name such as &%%\$# will produce the message "Illegal quantity error in 7560" and return the program to the Basic monitor.

Assuming the user does type his name correctly, the program uses it in various reinforcement messages throughout the lesson. Unfortunately, because these messages are in high-resolution graphics, the user's name can be a maximum of only six letters. Any name of seven or more letters is abbreviated to the first five followed by a period. As a result, users wind up being called names like Steph, Antho, Cathe, Rebec, Micha and Jenni.

Okay, so tell the kids to use nicknames and let's get on with it. The presentation of the four drill programs is more or less similar. An image appears in the top half of the screen. This can be a number of blocks, a color, a number spelled out, or one of seven different shapes. Every three seconds, the image in the bottom part of the screen changes. Eventually it matches (or is the right answer for) that on the top of the screen.

In other words, if there are four blocks in the top part of the screen, the bottom part of the screen will show a numeral. Every three seconds, a different one appears. The student must press any key on the keyboard when the correct number appears. Well, not quite *any* key. Obviously, RESET is a no-no. But so is beating on the keyboard, as that will most likely result in the program blowing up with the message "Syntax Error."

creative computing

SOFTWARE PROFILE

Name: Early Elementary Disk I

Type: Drill and practice

Author: Charles James

System: 48K Apple

Format: Disk

Summary: Drill for K-2

Price: \$29.95

Manufacturer:

Compu-Tations

P.O. Box 502

Troy, MI 48099

However, assuming our users are well-behaved and press the right answer, they are rewarded with a word such as "great," "right," "good," or "super" followed by some beep, bop, boop sounds and a happy face with a blinking eye. A wrong answer brings on a frowning face and no sounds. At the end of ten problems, a final score is given such as "10 right, 3 wrong." The program then asks if you wish to return to the menu. We found it somewhat disconcerting that some responses must be followed by a RETURN, for example, the question to go back to the menu, while other responses did not require a RETURN.

The teacher management file allows the user to adjust the number of problems (the disk comes set with ten to a session), turn the music on or off, turn the record keeping on or off (up to 35 students), view, delete, erase, or print the class file and vary the speed of presentation.

In summary, the concept of *Early Elementary Disk I* is very good, but the execution, particularly the error trapping routines (if there are any), leave much to be desired. Thus, we can only recommend this disk when it is used under the close guidance of either a parent or teacher.

Facemaker

Facemaker is a program designed to introduce young children, ages 4 to 8, to the computer keyboard and rudimentary programming. The program is menu-driven and easy to use.

Apple Education Packages

Title	Age	Subject
Micro Mother Goose	3-8	Early skills
PDI Preschool Library	3-6	Early skills
Early Elementary I	4-8	Early skills
Facemaker	4-8	Early skills
Bumble Plot	3-8	Numbers skills, logic
Mop Town	4-Adult	Logic
Match Game	7-Adult	Format to present
Tic Tac Show	7-Adult	drill and practice
Big Math Attack	7-14	Arithmetic
Multiploy	7-14	Arithmetic
The Arithmetic Classroom	7-14	Arithmetic
Edu-Ware Fractions	10-15	Fractions
Read and Solve Math Problems	9-15	Math word problems
Word Families	7-11	Word recognition
WordMate	7-11	Word recognition
Pal Reading Curriculum	8-13	Reading
Vocabulary Baseball	9-Adult	Vocabulary
Magic Spells	9-15	Spelling
Scramble	9-15	Spelling
Word Scrambler & Super Speller	9-15	Spelling
How to Read in the Content Areas	10-15	Reading
Fundamental Skills for Chemistry	15-18	Chemistry
Chem Lab Simulations	15-20	Chemistry
Weather Fronts	9-14	General Science
Tell Star	15-Adult	Astronomy
Understand Yourself	14-Adult	Self-analysis
Lovers or Strangers	17-Adult	Self-analysis

Atari Education Packages

Facemaker	4-8	Early skills
Golf Classic & Compubar	8-12	Graphs, angles
Snooper Troops	11-Adult	Note taking, reasoning

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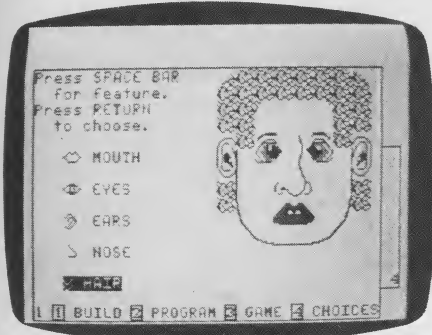
CIRCLE 125 ON READER SERVICE CARD

Learning Can Be Fun, continued...

To build a face, you press 1. Then you select various facial features: mouth, nose, eye, ear, and hair. For each feature you have eight choices. You simply sequence through the choices with the spacebar and select the desired one by pressing RETURN. That element is then added to the face growing on the right half of the screen.

At the Australian Computer Conference in Tasmania, Tom Stonier demonstrated a similar program with me as the model. The students took great delight in making choices for the facial features exactly opposite my actual features. My image wound up having small, beady eyes; a bulbous nose; a large, droopy moustache; huge ears; and no hair.

Once a face is constructed, a primitive program (more like a Logo procedure) can be written to make the face smile,



wiggle an ear, frown, pause a moment, wink and, finally, stick out its tongue.

In the past, I have suggested that a "programmable" toy such as Big Trak is a good pre-introduction to Logo. Now, here is another with the advantage that it runs on the same computer. Incidentally, Spinnaker has recently introduced *Delta Drawing*, a drawing and programming tool easier to use than Logo but with many of the same educational qualities. (We'll have a feature review of this package in an upcoming issue.)

Mode 3 on *Facemaker* is a memory

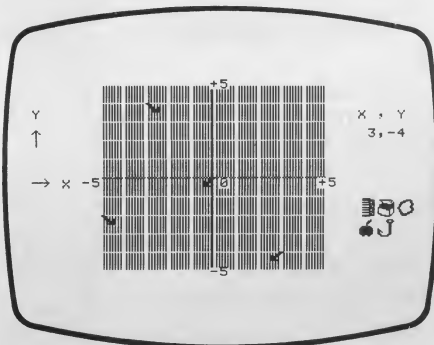
game. The face starts by doing one thing, say wiggling an ear. You must press E. It then does two things, say wiggle an ear and smile; you must press ES. The sequence gets longer and longer as the game progresses. Correct answers are rewarded with a pleasant sound while an incorrect answer elicits a Brooklyn razz.

Facemaker is an interesting and highly motivational introduction to the computer for young children. The approach is clever and the graphics outstanding.

Bumble Plot

The *Bumble Plot* disk is one of a series of learning games for pre-school and elementary age children from The Learning Company. Each one is attractively packaged in an accordion-fold jacket and comes with a full color, 12-page manual. The outside of the package states the learning objective and age range. For example, the *Bumble Plot* package reads, "Five challenging games that teach number lines, negative numbers and graph plotting. Ages: 8 to 13."

Bumble is a friendly green bug who acts as a guide to the child using the learning activities on the disk. In the first game, "Trap and Guess," Bumble thinks of a secret number in the range of -3 to 3. On the screen is a display that looks something like a ruler with gradations varying from -3 to +3. You first try to trap Bumble's number.



Let's say you type in -2 and 1. In this case, Bumble draws a purple trap around the numbers in that range and tells you whether the secret number is inside or outside of the trap. If it is inside, you can either type two numbers to make the trap smaller or try to guess the secret number. If the secret number is outside the trap, you must type two numbers to make a new trap.

"Bumble Bug" is a similar game, but it is played in two dimensions. In this case, the Bumble Bug is sitting on a grid which varies from -2 to +2 in both X and Y directions. You specify where you want a trap, and the Bumble Bug hops

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Name: Facemaker

Type: Educational game

System: 48K Apple, Atari, IBM

Format: Disk

Language: Machine

Summary: Draw funny faces

Price: \$34.95

Manufacturer:

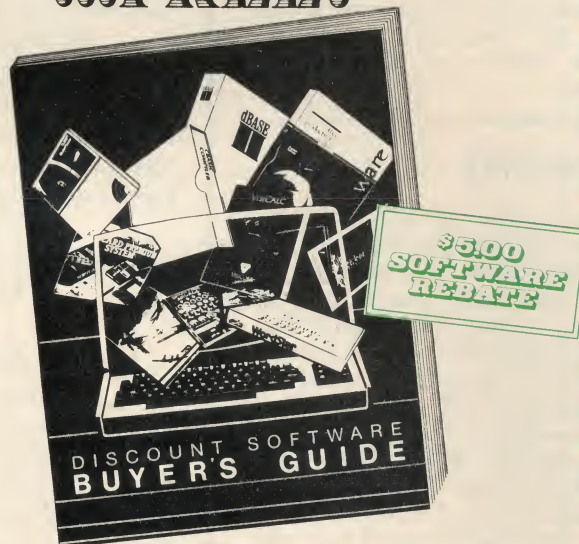
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Learning Can Be Fun, continued...

one space. Eventually, when he has no place to go but into your trap, you win.

In "Hidden Treasure," a larger grid, varying from -5 to +5 in both directions, is used. In this case, you are trying to guess the location of buried treasure. After each guess, Bumble tells you whether to make your X number larger or smaller and the same for your Y number. After you retrieve six treasures, a cute little graphic is shown of Bumble rowing them back to shore. This is a particularly good feature of all of the games from The Learning Company; correct responses are rewarded and incorrect ones are not. Much of the educational software on the market is deficient in this regard. It is frequently more fun to lose the game than to win it.

creative computing SOFTWARE PROFILE

Name: Bumble Plot
Type: Educational Game
Author: Leslie Grimm
System: 48K Apple
Format: Disk
Language: Machine
Summary: Makes learning fun
Price: \$60
Manufacturer:
The Learning Company
4370 Alpine Dr.
Portola Valley, CA 94025

The other two games on the disk enlarge upon the concept of grids. "Bumble Art" is a sort of connect-the-dots game played on a grid varying from -10 to +10. "Roadblock" is a game in which you must catch a moving bank robber with five moveable roadblocks. Each move is timed, but if you have learned your lessons well on the previous four games, winning this one shouldn't be too difficult.

With some of the other games from The Learning Company, light cardboard strips or key covers are included to divide the Apple keyboard into, for example, right, left, up and down.

Upon returning a warranty/registration card to The Learning Company, you receive a set of activity cards for each disk purchased. Each set consists of four double sided 5" square cards with games and activities that reinforce the computer programs. This is a thoughtful touch; while The Learning Company gains a mailing list, you get a nice extra for your time and stamp.

The Learning Company has done an excellent job with their entire line of games, and we give them an A+ on everything except their replacement disk policy. They charge \$12 for a back-up disk which, in light of the fact that most

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CIRCLE 128 ON READER SERVICE CARD

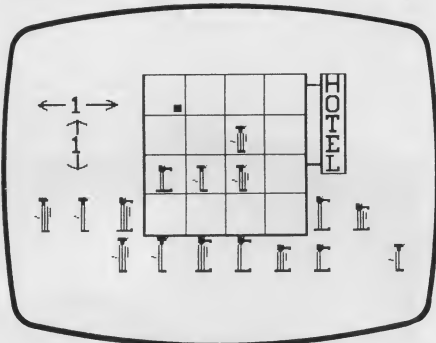
of the recreational software companies charge \$5, seems a bit out of line. However, they probably know how educators tend to "borrow" things from one another so their price may well be justified.

Mop Town

The Apple Special Delivery series of educational programs is produced by the folks at Advanced Learning Technology, Inc. who are the same people who produce the high quality programs for The Learning Company. (*Magic Spells* is the other disk currently available through Apple. As the name implies, it deals with spelling skills.)

Mop Town covers a wide age range, according to the packaging: "4 to adult." Using a cast of 16 characters in 11 different games, *Mop Town* emphasizes logic and attributes. The four attributes are tall or short, fat or thin, red or blue, and bibbit or gribbit (bibbits have big noses and big feet, whereas gribbits have tails).

As is stated in the rules, "Moppits get along with each other very well because they all follow the rules that govern Mop Town. There are rules for just about



everything that happens in Mop Town—what house a Moppit can live in, who can join a club; even who can be next to another Moppit in a parade."

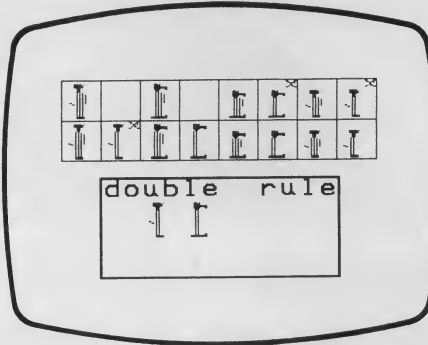
For example, in Game 3, "What's the Same?" we find four Moppits living in

creative computing SOFTWARE PROFILE

Name: Mop Town
Type: Educational game
System: 48K Apple
Format: Disk
Language: Machine
Summary: Learning logic attributes
Price: \$50
Manufacturer:
Special Delivery Software
Apple Computer, Inc.
10260 Bandley Dr.
Cupertino, CA 95014

the same house. There is at least one thing that is the same about all the Moppits. After seeing the picture of them, you must choose which attribute they all have in common.

In Game 9, "Club House," we learn that "the Mop Town club house only lets Moppits join that fit the rule." The object of this game is to guess the membership rule. The rule could be a single trait rule (e.g., only tall Moppits) or a double trait rule (e.g. only tall and fat Moppits). You select Moppits that you think fit the rule. If they do, the Moppit will appear in the club house; if not, an "X" will mark the Moppit you



chose. When you think you know the rule, you may type R (for guess rule). You will be shown a list of possible rules. Pick one and see if you are right.

The games are quite intriguing and lots of fun to play even if you are not trying to learn about logic attributes. But when you sneak into the computer room to play with the *Mop Town* disk that you got for your children, better turn off the sound or they will come running, too.

We very much like the policy of Apple Special Delivery Software which furnishes a back-up copy of each disk along with the initial package. This certainly overcomes the problem of making back-up copies or determining a fair price for them.

Our applause to Leslie Grimm for another delightful learning game and to Apple for their excellent distribution and that "free" back-up disk.

Match Game

In the *Match Game*, the computer presents a gameboard of four to twenty numbered boxes. Players uncover two boxes on each turn, trying to find boxes with matching contents. To play well, you must remember what is hidden in each box as it is uncovered. The game can be played with either exact matches (the same word appears in two boxes) or paired matches (such as synonyms, translations from one language to another, or math problems and answers).

After power-up, you are asked whether you want to make your own game with exact matches, make your own game with paired matches, play a game you have saved on disk, or play one of the seven games furnished with the disk. These games include an exact match of computer words and paired matches of synonyms, French-English words, addition, subtraction, multiplication, and division problems.

Five board sizes ranging from four boxes (two matches) to the largest board with 20 boxes (10 matches) are available.

Up to four players (or three players and the computer) may play simultaneously. Of course, one player can play alone to see how long it takes to find all the matches. One player can also play against the computer.

During play of the game, the program tells whose turn it is. On each turn, you press RETURN to begin your turn, then type in the number of the first box followed by RETURN and the number of the second box followed by RETURN. If you find a match, those boxes are flashed on the board, and you get another turn.

At the end of the game, the score of each player is shown, and the winner (if there is one) is named. You then go back

creative computing

SOFTWARE PROFILE

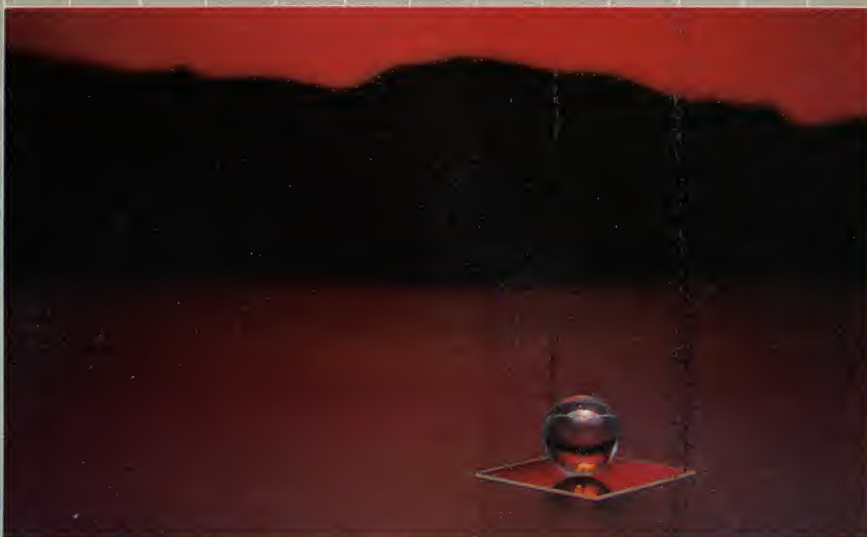
Name: Match Game
Type: Educational game
System: 48K Apple, 8K or 16K PET
Format: Disk or cassette
Language: Machine
Summary: Concentration revisited
Price: \$29.95
Manufacturer:
Teaching Tools
P.O. Box 50065
Palo Alto, CA 94303

to a menu which allows you to play the same or a different game with the same or new players.

Match Game is suitable for use at home or in the classroom. According to the instruction booklet, "teachers have found it useful for putting current reading words, spelling words, topic words, or math facts in a game format."

We found the game held the interest of players of many ages. With larger boards (12 or more boxes), most players wanted to be able to write down the math problems; it was just too difficult to remember two- and three-digit numbers and match them to corresponding arithmetic problems. While this isn't exactly the idea of Concentration, we still felt that the *Match Game* was valuable because it provided the motivation to do the problems quickly and accurately.

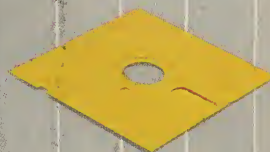
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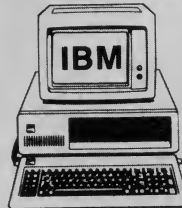
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9x9 Dot Matrix, 120cps, 2.3K, Gemini 15"	\$ 649	\$475
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TAXAN, RGB Vision I	\$ 399	\$339
SANYO, 9" Green, Model DM5109	\$ 200	\$139
12" Green, Model DM812CX	\$ 260	\$199
13" Color, Composite, Model DM6013	\$ 470	\$349
ZENITH, 12" Green, Model ZVM121	\$ 150	\$ 99
AMDEK, 12" Green #300	\$ 200	\$159
12" Amber, #300A	\$ 210	\$159
13" Color I, Composite	\$ 449	\$339
13" Color II, RGB, Hi Res (Ap. II, III & IBM-PC)	\$ 899	\$739
13" Color III, RGB, Commercial (Ap. II, III)	\$ 569	\$489
DVM, Color II or III to Apple II Interface	\$ 199	\$175
Note: Color II and III come with cable for IBM-PC.		

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HAYES, Micromodem II (for the Apple II)	\$ 379	\$275
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MICROCOM, Micro Courier for Apple II	\$ 250	\$175
Micro Telegram for Apple II	\$ 250	\$175
SSM, Transcend 1 for Apple II Data Comm.	\$ 89	\$ 69
NOVATION, Applecat II Modem	\$ 389	\$289
212 Apple Cat	\$ 725	\$599
HAYES, Stock Chronograph (RS-232)	\$ 249	\$189
Stock Smartmodem (RS-232)	\$ 289	\$225
Smartmodem 1200 (RS-232)	\$ 699	\$535
Micromodem 100 (S-100 bus)	\$ 399	\$275
SIGNALMAN, Modem MKI (RS-232)	\$ 99	\$ 79
IBM-PC to Modem Cable	\$ 39	\$ 29
AXLON, Datalink 1000 Hand Held Communications Terminal	\$ 399	\$325

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Apple Interface, Manual & Cable	\$ 300	\$239
Omni Disk Server for Apple II (Special)	\$ 990	\$495

Other Interfaces, Omni-Net, Constellation, Mirror, All in Stock



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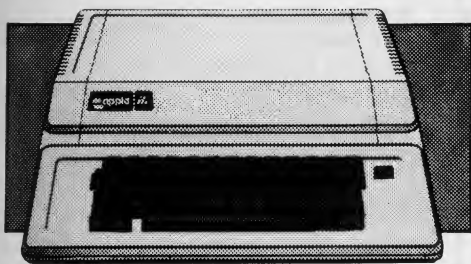
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RAM Card	128K \$ 599	\$459
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SSM, A10 II, Serial/Para Interface	\$ 225	\$169
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50% off other Apple Inc. software		
Applied Soft Tech., VersaForm	\$ 389	\$265
Artsci, MagicWindow II NEW!	\$ 150	\$ 99
Ashton-Tate, dBase II (CP/M) with		
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Continental, GL, AR, AP or PR ea	\$ 250	\$189
1st Class Mail	\$ 75	\$ 49
Home Accountant	\$ 75	\$ 49
Hayden, Pie Writer (Specify brd.)	\$ 170	\$ 99
* High Tech, Job Cost Control	\$ 750	\$350
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Howard Soft,		
Real Estate Analyzer II	\$ 195	\$129
Tax Preparer	\$ 225	\$149
Info, Unilim, Easywriter (PRO)	\$ 175	\$119
LJK, Letter Perfect w/Mail Merge	\$ 150	\$ 99
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Professional Billkeeper	\$ 750	\$395
Verdict, (Legal Billing)	\$ 750	\$395
* Micro Lab, Tax Manager	\$ 180	\$119
Micro Pro, (all CP/M)		
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Report Star	\$ 350	\$229
WordStar* - Training Manual	\$ 495	\$199
Mail Merge**	\$ 250	Call
SpellStar**	\$ 250	Call
SPECIAL! All 3 above	\$ 895	Call
Data Star**	\$ 275	\$175
MicroSoft, Multi Plan (CP/M)	\$ 275	\$175
Multi-Plan (DOS 3.3) New!	\$ 275	\$175
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The Dictionary New!	\$ 100	\$ 69
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programs for the Apple II	\$ 100	\$ 49
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Series 40 GL & AR & AP, all 3	\$ 595	\$395
Series 40 Inv. or Pay., ea	\$ 400	\$275
Series 9 Text & Spell & Mail, all 3	\$ 595	\$395

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Perfect Speller	\$ 295	\$139
Perfect Filer	\$ 595	\$289
Quality, GBS w/3 gen. (a DBMS)	\$ 650	\$475
Sensible, Sens. Speller, specify	\$ 125	\$ 85
* Silicon Valley, Word Handler	\$ 250	\$119
Sof./Sys., Executive Secretary	\$ 250	\$169
Executive Speller	\$ 75	\$ 55
Software Dimensions/System Plus,		
Acctg. Plus, General Ledger	\$ 425	\$295
Acctg. Plus, GL, AP and A/R	\$ 995	\$595
Acctg. Plus, above + Inventory	\$1395	\$775
Software Publishing, PFS, File	\$ 140	\$ 95
PFS Report	\$ 125	\$ 85
PFS Graph	\$ 140	\$ 95
Southeastern Data Capture, call to specify,		
STC, The Creator NEW!	\$ 200	\$139
Stoneware, DB Master	\$ 229	\$155
DB Utility I or II	\$ 99	\$ 69

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Visicalc 3.3	\$ 250	\$179
ViciCorp/Personal Software,		
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BASIC Compiler	\$ 395	\$299
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TASC Compiler	\$ 175	\$159
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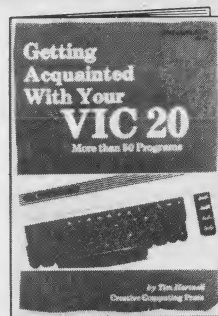
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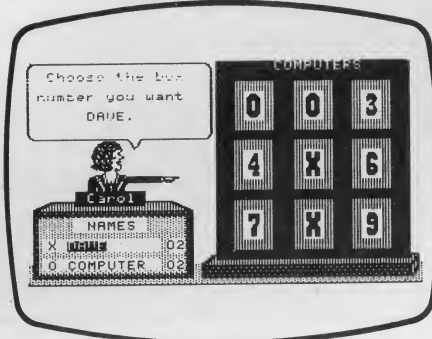
CIRCLE 131 ON READER SERVICE CARD

Learning Can Be Fun, continued...

Tic Tac Show

Tic Tac Show is an entertaining educational game which simulates a TV game show. The moderator sits at the left and talks to you out of a cartoon-style balloon. On the front of her desk is the score for the two players. To the right is a large tic tac toe game board with the numbers 1 to 9 on the playing positions.

Carol, the moderator, asks you to choose a number from 1 to 9. After you choose, a question is displayed. If you answer the question correctly, that block



is filled in on the tic tac toe board in your color. Next, it is the turn of the other player (or the computer if you are playing alone). So, effectively this is a game of tic tac toe with the X's and O's being placed based on correct answers to various questions—reminiscent of the old TV game show *Tic Tac Dough*.

The disk containing the game program has 14 categories of questions such as computers, sports facts, French vocabulary, Mother Goose, skiing, and myths. Additional subject disks with nearly 600 questions on each retail for \$19.95 apiece.

However, if you cannot find a subject that you like, the game disk contains its own authoring system which allows you to type in your questions and answers and save them on the disk. In this way, you can create an entirely new topic or topics. You can also add, edit, or delete questions from the existing series.

To add some spice to the game (after

all, tic tac toe is a bit dull), the designers have included a "wildcard" function. When this comes up in the game, the current player gets an automatic pass (equivalent to a correct answer). In addition, in a tie game when the ninth square is about to be played, the moderator occasionally offers to toss a coin to decide which player gets it. More than once, I have lost this coin toss to the computer, and the computer is never wrong.

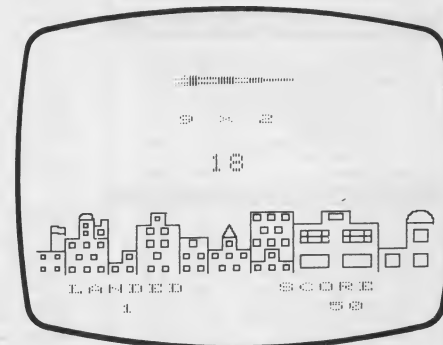
In summary, the concept, presentation and animation of *Tic Tac Show* are outstanding. The editing mode allows it to be adapted to a wide range of abilities, age groups and topics. We give it our top grade.

Big Math Attack

Big Math Attack is a mathematics drill and practice program in the guise of a Missile Command type of game.

At the beginning you choose which of the four basic mathematics operations (addition, subtraction, multiplication, and division) you want and at which of two levels you wish to play.

A stylized city that is under attack appears near the bottom of the screen. The words "Landed" and "Score" are



printed under the city. A rocket ship speeds across the top of the screen dropping an equation such as $4 + 2$ or 6×9 . You use the keyboard to enter the answer. Unfortunately, since the answer is being reproduced on the screen in high-resolution graphics, it takes quite a while to reproduce each numeral. Consequently, you may type 12 very quickly as the answer to a problem, only to find that the computer has accepted only the first numeral, 1. Although most players were able to adjust, we found some were more bothered by this time delay than others. The delay is especially annoying because speed is critical to the game score. The quicker an equation is destroyed, the more points are awarded. At first, the equations drop very slowly on the city. As more equations are solved correctly, the speed of their descent increases.

creative computing SOFTWARE PROFILE

Name: Tic Tac Show

Type: Educational game

System: 48K Apple

Format: Disk

Language: Machine

Summary: New CAI variation

Price: \$39.95

Manufacturer:

Computer Advanced Ideas
1442A Walnut St., Suite 341
Berkeley, CA 94709

Unfortunately, there is no way to correct a typing mistake. Even if you have plenty of time before the equation lands on the city, once you make a mistake, you are stuck with it.

The game ends when five equations have landed (five missed problems) or when a maximum score of 5000 is reached.

The sound effects are interesting at first, but become old fast. For classroom use, it would be highly desirable to have a way to disable the sound effects, but none is included on the disk.

creative computing

SOFTWARE PROFILE

Name: Big Math Attack
Type: Educational game
System: 48K Apple
Format: Disk or cassette
Summary: Math drill and practice
Price: \$25
Manufacturer:
 T.H.E.S.I.S.
 P.O. Box 147
 Garden City, MI 48135
 (313) 595-4722

Despite its shortcomings, *Big Math Attack* probably provides a higher level of motivation than other, more mundane drill and practice exercises. Two years ago, the execution would have been considered outstanding; today we expect more.

Multiploy

According to the instruction booklet, "*Multiploy* combines the excitement of an arcade game with the challenge of learning and practicing arithmetic skills." Well, yes and no.

To play the game, you use the keyboard to enter answers to problems that appear in four descending Problem Ships. A correct answer in your Answer Window causes a ray to be fired from the Answer Base which destroys one Prob-

creative computing

SOFTWARE PROFILE

Name: Multiploy
Type: Arithmetic game
Author: Paul Coletta
System: 48K Apple
Format: Disk
Language: Machine
Summary: Speedy drill
Price: \$24.95
Manufacturer:
 Reston Publishing Co.
 Reston, VA 22090

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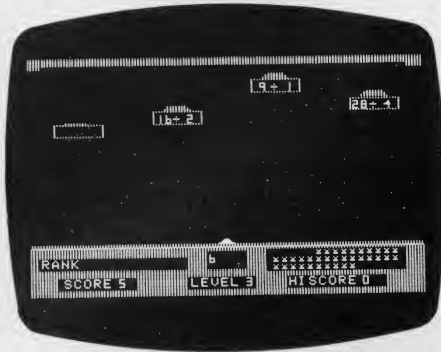
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CIRCLE 133 ON READER SERVICE CARD

Learning Can Be Fun, continued...

lem Ship. If you enter an incorrect answer, the Problem Ship(s) continue to drop, and the wrong answer disappears from the Answer Window.

To speed up play of the game on lower levels, the RETURN key may be pressed to clear the Answer Window of an in-



correct answer or to fire a ray before the computer normally would.

If a Problem Ship is not destroyed by the time it descends about half way down the screen, an indicator starts to blink, warning you that the Problem Ship will soon begin to shoot back. You may continue to enter answers until the Problem Ship either makes a direct hit on the Answer Base or becomes a Missed Problem.

The game ends when all the Problem Ships have been eliminated or when a Problem Ship destroys your Answer Base. You are then given a rank based on the number of Problem Ships you eliminated.

In playing *Multiploy*, you can choose an arithmetic operation (+, -, x, ÷), level of difficulty (1 to 3), and regular or "lightning" speed. We found these options provided a suitable starting point for most youngsters in the target age range of 4 to 14. You might want to give that precocious kid multiplication problems at Level 3, lightning speed. Just for grins, I tried it and got a score of 8 (out of a possible 40) for a rank of Uniploy.

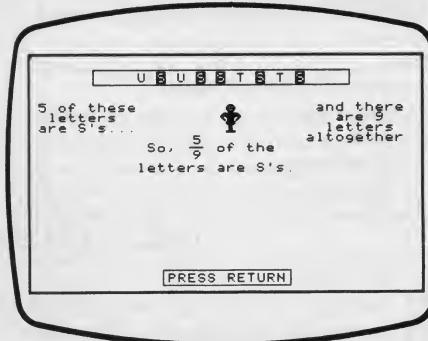
While *Multiploy* superficially resembles an arcade game with its four flying saucers and laser ray, it is actually drill and practice with a fancy timing mechanism. It held the interest of some of the youngsters who played it here although to a lesser extent than Broderbund's *Dueling Digits* (an equation building game in the arcade genre). Thus we suggest that *Multiploy*, like most educational games, be used with adult supervision and encouragement.

Fractions —Basic Concepts

The *Fractions—Basic Concepts* disk is one of a series of eight learning packages

in the Arithmetic Classroom series from Sterling Swift Publishing. Each one is packaged in a 7" x 9" three-ring binder which contains brief instructions for loading and using the disk, two sets of practice exercises, five copies of a student achievement record, and an answer key for the practice exercises.

The Arithmetic Classroom series is virtually identical to Swift's Elementary Mathematics Learning series except that it does not include the learning management system which contains mastery tests, diagnostic/prescriptive functions and an achievement record keeping system for up to 200 students. The Arithmetic Classroom is available on eight individual tutorial disks for \$49.95 each. A three-game disk for reinforcement costs \$29.95. The EMCL system with the learning management disks costs considerably more. Thus, the Arithmetic Classroom disks, despite their name, seem most suitable for home



use, although schools might want to get individual units.

The *Fractions—Basic Concepts* package is typical of the other eight. There are five lessons on the disk, each of which starts out with a tutorial. You are led through this tutorial by a cute androgynous (of indeterminate sex) cartoon character. The tutorial is a combination of text and graphics, although no color or sound is used.

creative computing SOFTWARE PROFILE

Name: Fractions—Basic Concepts

Type: Educational tutorial

Authors: Fawzy Tibrahim,
David N. McClintock and
Patricia M. Mullinix

System: 48K Apple

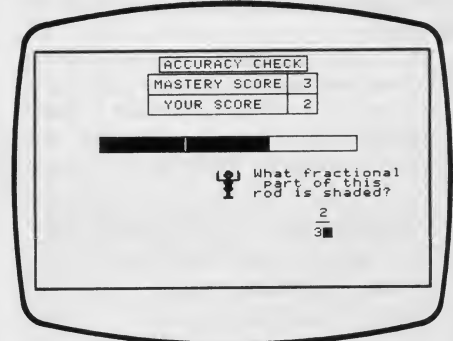
Format: Disk

Summary: Comprehensive learning system

Price: \$49.95

Manufacturer:
Sterling Swift Publishing Company
1600 Fortview Rd.
Austin, TX 78704

Following the tutorial, six related problems are presented for you to answer. After each answer, your friendly electronic tutor (shall we call him/her Terry?) gives you reinforcement by dancing a jig, juggling his head, or shooting an arrow which is actually your

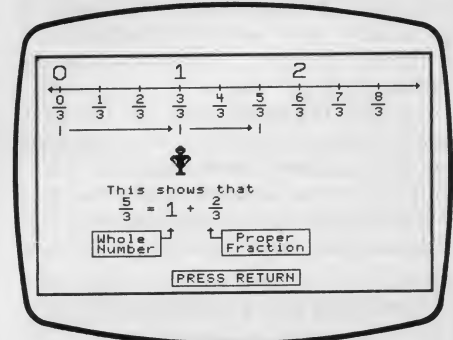


name. If you miss a problem, Terry is not content merely to flash the correct answer; rather he reviews the procedure for obtaining it.

After the six problems, Terry shows your score and asks if you would like to review the concept further or go on to the next lesson. If you have completed several skills, before going on to the next one, Terry gives you a short mastery test of all of the previous ones. Again, corrective feedback is provided if you stumble on any of the problems.

The five student achievement record sheets (which may be copied) provided in the manual are a good place for keeping track of the progress of different members of the family or students in the classroom.

In our previous review, we were enthusiastic about the Swift Elementary



Mathematics Classroom Learning System. We are equally enthusiastic about the Arithmetic Classroom. We like the objective-based tutorial approach, the drill and practice exercises which rarely repeat, the excellent feedback in the event of an error, and the positive reinforcement for correct responses.

Our only negative observation is that Sterling Swift does not have a policy for obtaining back-up disks. They charge \$9.95 for a replacement of the original disk. This seems a bit steep to us.

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-Leigh Goldstein,
Electronic Games



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Edu-Ware Fractions

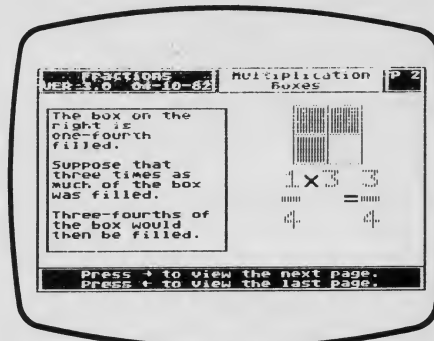
The *Edu-Ware Fractions* disk contains four major components: a learning manager system which allows an adult (parent or teacher) to tailor the presentation of the instructional materials, a pre-test which measures the learner's knowledge and skills before entering any of the learning modules, six learning units each designed to teach a different skill used in fraction computations, and a post-test which assesses the learner's new skills after completing the units.

The six learning units cover definitions and parts of the fraction, denominators, and fraction arithmetic (addition, subtraction, multiplication, and division).

Each learning unit consists of ten pages (screens) of instructional material. Pages are all done in high-resolution graphics and use upper and lower case letters, diagrams, and animation where appropriate. Some of the pages are definitions and demonstrations, while others

require the user to fill in one or more blanks or complete a problem. These frames lead the user step-by-step through each part of the learning experience.

For example, one of the more difficult conceptual skills for learners to master is that of equality. Hence, the unit on denominators introduces examples of frac-



tional manipulation and gives the learner considerable practice. Skills introduced are: changing denominators, finding the common denominator by using prime factors, reducing denominators, and finding the lowest common denominator. Once the user has mastered these skills, he will have a much easier time with the units on addition, subtraction, multiplication and division of fractions.

The user can move from any page in a learning module to either the next page or

creative computing SOFTWARE PROFILE

Name: Edu-Ware Fractions
Type: Tutorial
Author: Sherwin Steffin, et al.
System: 48K Apple
Format: Disk
Summary: Fraction tutorial
Price: \$49
Manufacturer:
Edu-Ware Services, Inc.
P.O. Box 22222
Agoura, CA 91301

Scrambling Words

Within the past year, many manufacturers have brought word scramble programs to the market. In this comparative review, we'll take a look at three such programs. Before rushing out to buy one of these, you may want to consider just what educational value they have. Scrambled word exercises are not in wide use in school curricula. The computer makes it easy to mix up the letters of a word, present it, and accept guesses for the unscrambled word. But does that help the student spell the word or recognize it in context? Simply because something *can* be done does not automatically mean it *should* be done. But if you think scrambled word exercises are worthwhile, read on.

All three programs have certain elements in common. All have two main parts. The first part presents the scrambled words, and then requires the user to type the unscrambled words. A second part of each package is an editor which allows a teacher or parent to enter lists of words, change words on existing lists, display lists of words and the like.

Magic Spells by Leslie Grimm of Advanced Learning Technology is distributed by Apple Computer's Special Delivery Software Division. Of the three programs, this is the closest to a game. The disk opens with a high resolution graphic welcoming you to Spells Valley. You journey from there to the Kingdom of Spells where you meet the Wizard of Spells, who has twelve lists of twenty

words each to be unscrambled. You can select any one of the lists.

The instructions tell us, "There are twenty chests of gold and jewels hidden throughout the castle. Each one may be opened if you know the right spell."

"A word of warning... you are not alone in the Castle of Spells. The spelling demon will be close behind, waiting to take some of your treasure should you fail to give the correct spell."

At the beginning of the game, you are shown a screen with ten unscrambled words on it. If you wish, you can write these words down on a piece of paper. Pressing RETURN displays the second half of the list. The word lists that come with the disk are also found in the appendix to the manual.

The unscrambling process then begins. Twenty closed treasure chests are pictured at the top of the screen. A scrambled word is shown in the center of

the screen. You type your guess for the word below it. If your guess is correct, the first treasure chest pops open and

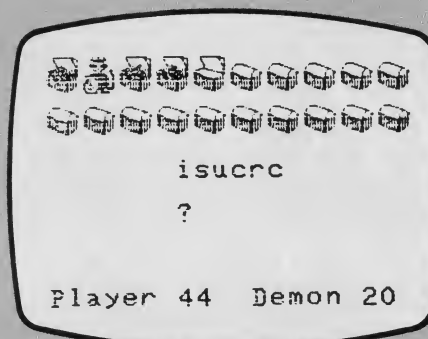
creative computing SOFTWARE PROFILE

Name: Magic Spells
Type: Educational game
Author: Leslie M. Grimm
System: 48K Apple
Format: Disk
Summary: Unscramble words
Price: \$45
Manufacturer:
Special Delivery Software
10260 Bandy Dr.
Cupertino, CA 95014


you are awarded a number of points corresponding to the number of letters in the word.

If you spell the word incorrectly, a clue appears below the scrambled word. The clue shows the letters you placed in the correct position and question marks in the other positions. This clue remains on the screen as you try to guess the word again. You can try for the word as often as you wish. When you get it, the treasure chest is replaced by the demon, indicating the word was spelled without help but in more than one try. You and the demon divide the points for that word.

If you just can't guess the word at all,



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Learning Can Be Fun, continued...

the preceding one by pressing the right or left arrow key respectively.

For those who prefer to get directly into using the learning modules, the learning manager system is not required. However, the use of it allows a great deal of flexibility in tailoring the learning experience to an individual user. For example, the instructional material can be presented in a sequence which you preselect, you can let the pre-test select the learning sequence, or let the learner choose his own learning sequence. You can change the number of incorrect responses the learner is allowed for a practice problem before the system will take him back to review material. You can add or delete units to be tested in the pre-test or post-test, change the number of problems, view pre-test or post-test scores, and so on.

The 14-page instruction manual describes the use of the disk in detail, discusses the learning manager system and options, and describes the instructional model (assumptions, objectives, sequenc-

ing, classroom utilization) of the package.

Edu-Ware Fractions is one of a series of programs from Edu-Ware Services, all of which we have found to be of excellent quality. We also applaud Edu-Ware for their policy providing low cost (\$5.00) updates of their packages when new ones are released.

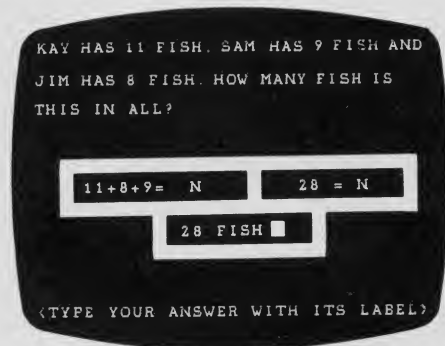
Read And Solve Math Problems

Read and Solve Math Problems is called in the manufacturer literature, "a progressive tutorial and drill program that teaches the important elements of word problems and conversion of written problems to number problems. The program allows interaction between the student and the computer, provides reinforcement of all concepts, and reteaching where necessary. The program is self-scoring and will not allow

the student to progress to higher level concepts until the previous lesson has been mastered."

There are ten lessons, five on each disk. The first two lessons focus on finding the key words in addition and subtraction problems. The student is given a series of problem statements in which he must identify words such as "altogether, in all, total, fewer, and smaller."

The lessons then progress to writing



you can type an * and the unscrambled word will replace the scrambled one. However, in this case you get an empty treasure chest and the demon takes all of the points for that word.

At the end of the game, your final score is displayed until you go back to the main menu.

The editor portion of the disk called *Spells Writer* has five options:

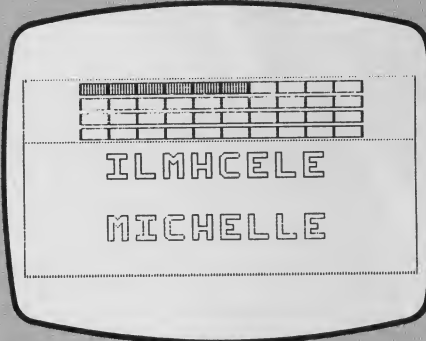
1. Enter a new list of words
2. Delete an old list of words
3. View a list of words
4. See list of file names
5. Copy list on printer

There are also options to make back-up copies of the disk, replace back-up copies, and make word list disks. Each of these editing functions is fully described in the comprehensive 25-page manual. Words may consist of upper and lower case letters, apostrophes, hyphens, and periods. The left arrow may be used to correct a spelling mistake both while entering words with *Spells Writer* and while playing the game.

The only problem we experienced with the disk is that it is not tolerant of rapid typing when you are playing the game. This is because each letter is shown on the high resolution screen and it takes time for the computer to draw the letter and get ready to accept the next one. Error trapping is excellent, and pressing RESET in the middle of the game is the only way to hang up the program that we found. The package comes with both a master and a back-up disk and is an all-around professional job.

Scramble by Ahead Designs is similar in concept to *Magic Spells* but not in execution.

Upon loading the disk, the user is directed to "Enter your name." The screen then displays the 20 words in word file A. These are displayed one at a time; pressing RETURN brings up the next word. This is a rather time consuming



procedure compared to displaying the list in two groups of ten words each.

After the list of unscrambled words has been displayed, the game starts. As in *Magic Spells*, the screen is divided into three parts. The top part has a grid of 40 rectangles (4 x 10), each one being worth five points. The center part of the screen displays the scrambled word. If you spell it correctly on the first try, two rectangles in the grid are filled in for a score of ten points. If you spell it incorrectly, there is no clue given. Instead, the scrambled word is rescrambled and shown again. In many cases, this second scrambling is helpful in that it shows dif-

ferent letter combinations and may point the user to the correct word.

You have two tries to spell the word correctly. If you spell it correctly on the second try, your score increases by five points. A misspelled word on the second try causes "incorrect" to appear at the bottom of the screen and the word is automatically presented correctly spelled. A new scrambled word then appears.

If your score reaches 180 or higher, "Super Speller" is displayed. Upon entering the last word, you almost immediately get the message, "Game Over," and the screen is erased in preparation for a new user who is directed to "enter your name."

We found that some users were disappointed that their score disappeared so quickly and could then be viewed only by entering the Teacher Utility

creative computing SOFTWARE PROFILE

Name: Scramble

Type: Educational game

Author: Sandy Head

System: 48K Apple

Format: Disk

Summary: Unscramble words

Price: \$15.95

Manufacturer:

Ahead Designs
699 North Vulcan
Encinitas, CA 92024
(619) 436-4071

creative computing SOFTWARE PROFILE

Name: Read And Solve Math Problems
Type: Tutorial
Authors: Anne Edson and Allan Schwartz
System: Apple, Pet, or TRS-80
Format: Cassette or disk
Language: Machine
Summary: Learn to solve word problems
Price: 5 cassettes \$78, 2 disks \$85
Manufacturer: Educational Activities Inc.
 P.O. Box 392
 Freeport, NY 11520
 (516) 223-4666

equations and using them to solve addition and subtraction problems. Since the package is geared to grades 4 to 6, the

equations are relatively simple and consist of problems such as

$$31 + 18 = n$$

The second disk goes on to multiplication and division problems along with more addition and subtraction problems, although no problems combine more than one numeric operator.

After a basic concept is explained, a typical screen presents a problem in the top two or three lines. For example, "there were 72 people at the rides. Each car at the rides could hold 8 people. How many cars were needed?"

The student is then asked to type in the left side of the equation, in this case, "72/8." He is next asked for the variable, which is always n , and is told to solve for n . Finally he is asked to type in his answer with its label, in this case "9 cars." After each correct answer, the word "great," "correct," or "right" appears on the screen in a cute graphic form accompanied by some beeps and boops. After all the problems in one lesson have been completed, a final score is

given by means of another cute animated graphic presentation.

Included with the package are ten reproducible activity masters to reinforce the concepts presented and four masters for use as pre- and post-test.

Read and Solve Math Problems is a good solid tutorial and drill package and should find favorable acceptance in the classroom.

Golf Classic and Compubar

Golf Classic provides practice in estimating angles and lengths. When the program is loaded, a bird's eye view of one hole on a golf course appears on the screen. The ball is shown on the tee. Your object is to "hit" the ball into the hole on the green with the fewest possible strokes. When it is your turn, the program asks, "What angle would you like to use?" You enter an angle between

menu. Calling this menu is also the only way to change the starting word list.

The Teacher Utility also allows default parameters to be changed, a word file to be copied, edited, or displayed and the list of student scores to be displayed. The grade book records the scores of up to 30 students. The scores are not saved on the disk so they are lost, of course, if the computer is turned off or RESET is pressed.

The disk is not copy protected so it may be copied on a blank disk for regular use while the master disk is kept in a safe place.

The Avant-Garde disk, *Word Scrambler & Super Speller* includes a spelling practice program in addition to the word scrambler program which some users may find desirable.

The first time we loaded the disk we were a bit put off. The opening title on the disk takes an interminably long time to appear, and the prompts and instructions for using the disk are somewhat cryptic. There is no instruction manual or sheet with the package, and after it was loaded we pressed RESET at an inopportune moment causing the disk to self-destruct. Perhaps Avant-Garde has deemed a copy protection scheme of this type necessary, but we think that most users will find it undesirable.

We were more careful with the replacement and had no further trouble.

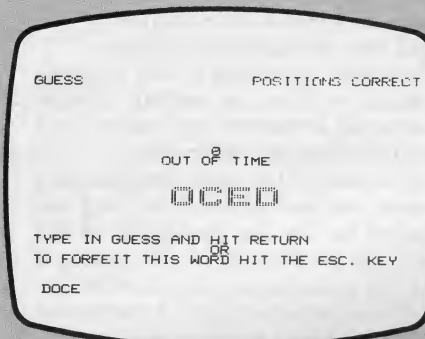
Unlike the other scramble programs, this one does not show the word list in advance. Instead, if you select the scramble option, you are asked for the

amount of time you wish to allow to decipher a word and which of the three word lists you wish to use. There are lists for students in Grades 0-3 (words with two to four letters), Grades 4-8 (four to eight letters) and "experts" (five to fourteen letters).

The scrambled letters of a word appear on the screen along with a counter indicating the seconds remaining to guess the word. We found this made some users very nervous, and caused them to "clutch" as in a timed exam.

When you type in a guess, the program indicates the number of letters that are in the correct positions, but not which ones they are. You get three guesses to get the word, and you receive one point if you get it without a hint and one-half point if you need a hint.

One feature to which we object in this



program is that a correctly spelled word is considered wrong if it is not the one the program is seeking. For example, the scrambled letters SINP appeared. We entered SNIP and were told "That's not it. Try again." Okay, we put in PINS. Wrong again. Last try, NIPS. Wrong again. The word the program was looking for? SPIN.

In the spelling practice mode of operation, a word is quickly flashed on the screen, and you must type it in. As with the word scrambler, you get three tries to get it. Incidentally, flash card presentations are alternated with scrambled words if you select the scramble option.

Like the other programs, this one allows you to enter your own lists of practice spelling words.

All in all, we felt that *Word Scrambler & Super Speller* was the least user-friendly of the three packages. However, it offers the additional flash card spelling practice mode that the others do not and thus may better meet your needs.

creative computing SOFTWARE PROFILE

Name: Word Scrambler & Super Speller
Type: Educational game
System: 48K Apple
Format: Disk
Language: Machine
Summary: Unscramble words
Price: \$19.95
Manufacturer: Avant-Garde Creations
 P.O. Box 30160
 Eugene, OR 97403
 (503) 345-3043

Learning Can Be Fun, continued...

0 and 360 degrees and press the RETURN key. You may enter negative angles if you wish.

A diagram in the lower right corner of the screen shows a circle with four angular directions marked on it, 0, 90, 180, and 270 degrees. Pressing H puts a grid over your ball to assist you further.

After you have entered the angle you wish, the computer asks, "How many units long?" A line one unit long is shown in the lower corner of the screen. The unit length is different each time you play a round. You may enter your unit length using decimals as well as whole numbers.

Once you land on the green, the computer puts for you and tells you how many putts you took. Of course, the closer you land to the hole, the fewer putts the computer has to take for you.

There is a one-stroke penalty for going out of bounds or into a water hazard. When you are shooting from a sand trap, your ball may go at a slightly different angle or distance than you chose.

The game may be played by one to four players. A reusable scorecard, which may be marked with a wax crayon or water-soluble marker, is included with the software package.

Compubar, according to the package, "provides practice in reading graphs, constructing arithmetic expressions, and mental addition and subtraction."

At the start of the game, five blue bars between one and fifteen units long are displayed in the top two-thirds of the screen. At the bottom of the screen, a green bar is displayed, also between one and fifteen units in length. A horizontal (x) axis with unit markers and labels at 0, 5, 10, and 15 is shown in the center of the screen between the blue bars and the green bar.

Your objective is to combine three or more bars, from the blue graph to form a

bar the same length as the green goal bar shown below. You may use each blue bar only once.

You press + to add a bar, - to subtract a bar, and S to stop when you have completed your answer. If the red bar you have made is the same length as the green goal bar, you win. Perfect scores earn a display of fireworks when you stop.

We found in playing *Compubar* that, in general, the answer must be completely thought out before starting to add and subtract bars. For example, in one problem we had blue bars that were 11, 9, 5, 3, and 2 units in length. Our goal was to construct a bar 15 units in length. Only one solution is possible ($11 + 2 - 3 + 5 = 15$). Trial and error was not likely to yield this solution, particularly since you are not permitted to make a bar less than 0 nor more than 15 units long at any time.

A reusable *Compubar* card on which you may use a crayon or marker to shade in bars and try to combine them is provided. We found however, that most users preferred to form an algebraic expression and simply add and subtract numbers rather than manipulating bars. On the other hand, the algebraic approach probably provides practice in skills that are at least as valuable as manipulating the bars.

We would have preferred that the program not return to the initial title after completing an exercise but instead provide the opportunity for another student or group of students to play the same game. We feel this approach is particularly desirable on the Atari computer given its rather long load times. Nevertheless, the package is well done and representative of the high quality programs in the Milliken EduFun! series.

creative computing SOFTWARE PROFILE

Name: Golf Classic and Compubar

Type: Educational game

Author: William Kraus

System: 16K Atari 400 or 800
(cassette), 32K Atari 800 (disk)

Format: Disk or cassette

Language: Machine

Summary: Learn to estimate
angles and length

Price: \$29.95 (cassette),
\$32.95 (disk)

Manufacturer:

EduFun! Division
Milliken Publishing Co.
1100 Research Blvd.
St. Louis, MO 63132

Word Families

Word Families contains three different categories of material: beginning consonants, ending consonants, and medial vowels.

Upon loading the disk, you are asked to enter your name. You are then given a choice of nine groups of words, three in each of the three categories mentioned above. The word list is loaded and shuffled and then presented, one word at a time, at the top of the screen.

A word appears with one letter underlined. Below it are four additional letters. From this group you select the letters that will make a complete word when substituted for the underlined letter. If your selection is correct, the letter disappears from the list and the new word appears on the stylized TV screen at the bottom of the screen. If your

creative computing SOFTWARE PROFILE

Name: Word Families

Type: Educational drill

Author: Robert Hartley

System: 48K Apple

Format: Disk

Language: Machine

Summary: Learn families of words

Price: \$29.95

Manufacturer:

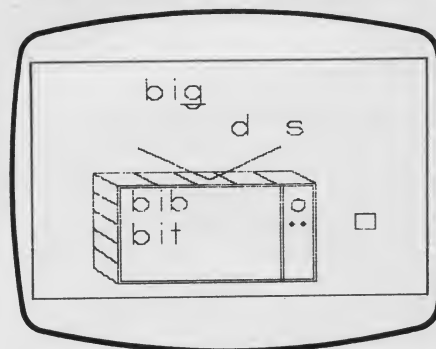
Hartley Courseware Inc.
P.O. Box 431
Dimondale, MI 48821
(616) 942-8987

selection is incorrect, the response is recorded on the student file, but the screen does not change. After finding all of the words within a group, an X shows in a small box at the right of the screen. This signals the user to press RETURN to bring on the next presentation.

For example, in beginning consonants, the word *like* is presented with the l underlined. Four letters are shown: s, h, d, and b. In this instance, all the letters except s will form a word when substituted for the l.

After every ten correct responses a clown's face appears on the screen.

Lessons vary from 22 to 39 words long. After a lesson has been completed



the number correct out of the total number of attempts will be shown. Pressing the ESCAPE key exits the program at any point and displays your results to that point. Results are automatically stored in the "student planning" file.

The student planning file holds records for up to 100 students.

A second part of the disk allows a teacher or parent to delete, add, and examine words in the different lists. The student planning file allows a teacher or parent to examine previous scores, clear the file, or print student records on a printer.

Error trapping is excellent and short of pressing the RESET key, we found nothing that would abort or destroy the program.

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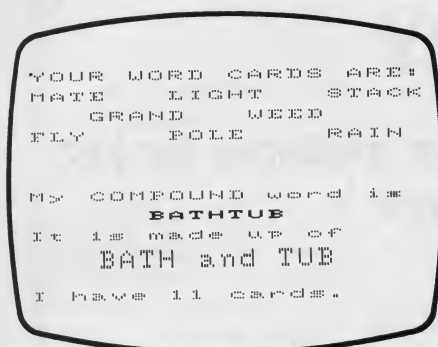
Word Mate

Word Mate is a game played against the computer in which you produce compound words from shorter words. The object of the game is to help you recognize closed compound words.

At the beginning of the game, you are dealt ten word cards. You try to match two of the word cards to make a compound word. For example, if your word cards are:

rain nest coat good

you would enter *raincoat* as a compound word. Nest and good would remain in your hand. The computer plays against you. You can type one compound word on each turn. If you cannot match two words, you press the RETURN key. The computer then tells you how many cards



it has in its hand. You type the number of the word card you want from the computer hand. You and the computer take turns until one of you finally wins. Beware, the computer does not make mistakes. Each compound word the computer produces is shown on the screen along with the two smaller words from which it was made.

The disk comes with ten word lists of ten compound words each. If you wish, you can enter new words or entire word lists. You can view the new words you have loaded into a word file, but unfortunately, you cannot view the 100 words that are already on the disk.

Word Mate is menu-driven and uses colorful, high-resolution graphics to dis-

play all of the instructions and words in upper and lower case. The program is well designed and has good error trapping routines. Recommended for grades 3 to 6.

Pal Reading Curriculum

PAL (Personal Aid to Learning) is a unique diagnostic and tutorial system that goes well beyond the standard drill and practice approach of so many other programs. The *Pal* system covers reading education for grades two through six.

The *Pal* system consists of two parts, a master disk package and curriculum packages. The master system contains a disk with a mini operating system for the *Pal* curriculum disks. It also includes an upper/lower case chip for your Apple in case you do not already have one installed. This allows the lesson material to be presented in a "real world" format without having to use the high-resolution screen. The booklet provides complete instructions for installing the chip.

Upon loading the system, *Pal* asks if you know what objective you wish to start with. The 32 objectives covered by the Reading-Level 6 curriculum package are listed on Pages 9-11 in the manual. However, if you are not sure where you want to start, *Pal* will suggest a starting point. If you have not used the system before, *Pal* will start at the beginning, appropriately enough. If you have used the system and recorded your previous results, *Pal* will pick up where you left off.

Initially, *Pal* instructs you to load a Discovery Disk. This is an evaluator. It has five questions on each of the 32 objectives. You can elect to take the entire 160-question test or just selected objectives. At the end, *Pal* will give you your score and indicate the areas, if any, with which you had difficulty. There are three discovery disks; *Pal* gives you explicit instructions as to when to use each one.

The Learning Disks contain the lessons and exercises to correct the difficulties found on the Discovery Disks. Instruction typically starts out with five or six screens of tutorial material. Each screen contains a modest amount of information, in upper and lower case, of course, with highlighting for the key points. You can study this for as long as you wish, and then press the space bar to proceed. Fast readers will be a bit frustrated at the slowness with which the information appears on the screen; this is because of the extensive amount of disk accessing. However, for the most part, the speed is appropriate for the target grade levels.

After the tutorial screens, several questions are presented. If you miss any of these questions, or if you missed a question on the discovery disk, *Pal* will show you exactly what you missed, explain why your answer was incorrect,

creative computing

SOFTWARE PROFILE

Name: Pal Reading Curriculum

Type: Tutorial

Authors: Dale Foreman,
Stanley Crane,
and Daniel Myers.

System: 48K Apple

Format: Disk

Summary: Great graphics and action

Price: Master \$99.95

Manufacturer:

Universal Systems
for Education, Inc.
2120 Academy Circle, Suite E
Colorado Springs, CO 80909

and show you the correct answer. This approach is far superior to systems that simply tell you what you missed or just show the correct answer.

Pal uses a mastered, tried and not tried method of scoring, rather than a raw score. The system can produce three reports: a student report gives the progress of an individual student, a class report lists all students and shows their progress toward a selected goal, and a grouping report groups students into three categories (mastered, needs more work, not tried) on a selected objective. These reports can be printed as well as viewed on the screen. A *Pal* master disk can keep the records for up to 30 students.

In summary, *Pal* is an outstanding remedial/tutorial system with a friendly, personalized approach that is non-threatening to the poor reader. It is validated against the most widely used textbooks and should be of interest to parents for use at home as well as to teachers for classroom use.

Vocabulary Baseball

Vocabulary Baseball is a multiple choice quiz about vocabulary words in the guise of a baseball game.

At the start of the game you are given a choice of three games: a short (one-inning) game consisting of three outs (or three incorrect answers), a two-inning game which allows six incorrect answers, or a three-inning game which allows nine outs.

When the game starts, the upper two-thirds of the screen is occupied by a stylized baseball diamond. An abbreviated

creative computing

SOFTWARE PROFILE

Name: Word Mate

Type: Educational game

System: 48K Apple

Format: Disk

Language: Machine

Summary: Learn compound words

Price: \$25

Manufacturer:

T.H.E.S.I.S.
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CATERPILLAR
 O.K., the Caterpillar does look a lot like a Centipede. We have spiders, falling fleas, monsters traipsing across the screen, poison mushrooms, and a lot of other familiar stuff. COLOR 80 requires 16k and Joysticks. This is Edson's best game to date. \$19.95 for TRS 80 COLOR.



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WIZARDS TOWER — This is very similar to Quest (see above). We added wizards, magic, dragons, and dungeons to come up with a Quest with a D&D flavor. It requires 16k extended color BASIC. \$14.95 Tape, \$19.95 Disk. VIC 20 Commodore 64.



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Mandatory	Expatiate	Eclectic

scoreboard which indicates the number of runs, hits, and outs appears on the right.

As each player comes to bat, he can try for a single, double, or triple. He is awarded a hit if he correctly defines the word presented. An attempt for a single base hit results in an easier word, while a player trying for a triple must guess the meaning of a much more difficult word. Table 1 shows seven words that we found in each category. We felt that many of the words in the triple group were extremely difficult and not likely to be known by any but the most dedicated of lexicologists. For example, *susurrant* is not even in Webster's New Collegiate dictionary. Furthermore, the definition for *apse* required by the program is recess, which is a secondary meaning again not listed in Webster's.

The definition for replication required by the program also calls for the second meaning of the word (echo). For the meaning of eclectic, which would you choose, selecting or comprehensive? I chose the latter but the program was looking for the former. Playing a triples only game, three innings, on average I scored between 12 and 20 correct before getting nine outs—and words are my business!

When the player completes the program, if his score is higher than that of the present record holder, his name and total are recorded on the disk as the score to beat. According to the instructions, "this competitive aspect of the game encourages students to try it again and again. In this process they improve their vocabulary."

The instruction sheet with the disk describes how to eliminate names and

scores and start over with a clean slate. It also describes how to list the existing words and change them or their definitions.

To restart the disk after a play of the game, RUN must be typed, and the program starts over from the beginning. A better way would be to ask, at the end of the program, whether another student was waiting to play or if the current student wanted to play again. This would save having to reload the start-up graphic, re-enter the student name, and reload the word file.

Although there are nearly 1000 words on the disk, the random number generator appears to cause the program to

creative computing SOFTWARE PROFILE

Name: Vocabulary Baseball
Type: Educational game
System: 48K Apple
Format: Disk
Language: Machine
Summary: Game to improve your vocabulary
Price: \$29.50
Manufacturer:
J & S Software
140 Reid Ave.
Port Washington, NY 11050

start at a similar point in the list each time it is run. While this gives students a head start on subsequent plays of the game, (assuming they learned the definitions from the previous game) it does not expose them to as many new words as one might expect. Nevertheless, we judged *Vocabulary Baseball* an effective vocabulary builder, although it is unlikely that many students will come to know and use the words in the triple category.

How To Read In The Content Areas

How To Read In The Content Areas is one in a series of software packages from Educational Activities to help students read with understanding.

The literature tells us that the program package is designed to help students master the following concepts: "spotlighting for vocabulary building and learning the meaning of new words and concepts; surveying to determine the information given in a particular reading; detecting main ideas and inferences; recalling important facts, ideas, and details; and utilizing and applying skills to content areas." This description reminded us of jargon we have read in educational grant proposals.

What the program boils down to is a presentation of five or six paragraphs of information followed by questions about them. On each disk, are four programs each of which presents five to eight

2. Local weather bureaus, situated throughout the world, get needed information from a world organization. Farmers can forecast expected frost, sea captains know when to change courses, and airplane pilots know where to fly around storms because of the information provided by the weather bureaus.

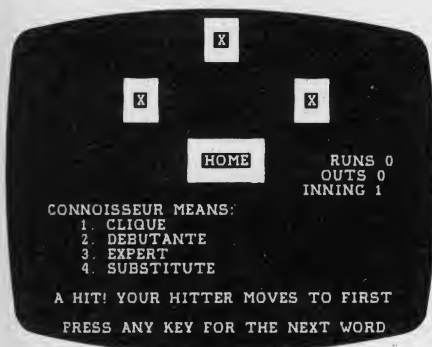
(Press Any Key To Continue)

screens of text on a particular subject. Large upper and lower case letters are displayed on the high-resolution screen, so this is not as much text as it might sound. Following the presentation of the text, the student is presented with seven questions (multiple choice, true/false, fill in the blank and find a word) which he must answer. If a question is answered incorrectly, the screen of information from which the answer can be derived is shown again, and the question repeated.

Although the manufacturer's literature tells us "through the clever use of graphics, the microcomputer rewards successful student performances with vi-

creative computing SOFTWARE PROFILE

Name: How To Read In The Content Areas
Type: Tutorial
Author: E. Insel and A.N. Rabin
System: 48K Apple
Format: Disk
Language: Machine
Summary: Reading skills development
Price: \$49
Manufacturer:
Educational Activities Inc.
P.O. Box 392
Freeport, NY 11520



sual prizes," the visual prize turns out to be a word such as "nice," "great," or "super" in large type on the screen. However, users did not seem to object to this nearly as much as they did to the delays in responsiveness of the software when typing in word answers. The reason for the delay is that the letters are

displayed in the high-resolution mode, and it takes the computer a while to draw each one on the screen. However, even fifth and sixth graders (the target age range of the programs) were able to hunt and peck faster than the software was able to accept their answers.

On the bright side, each disk in the

How To Read In The Content Areas series comes with five reproducible activity sheets which contain key words from the text in interestingly shaped word search puzzles. The brief instruction sheet includes a description of how to use the program and answers for the word search puzzles.

Profile of a Snooper Trooper

This year was 1978. The month was January. The meeting was set for the following Tuesday at the home offices of one of the largest game makers in the world. Tom Snyder, now the president of Tom Snyder Productions (formerly Computer Learning Connection) in Cambridge had an appointment with a key executive at Parker Bros.—the head of game acquisitions.

Tom recalls, "I had looked forward to the meeting for months, constantly redesigning my game called Personk, a wood-wire-string contraption that was a simplified model of a computer. I had put an enormous amount of my own time and money into the project."

When the fateful Tuesday finally arrived, Tom discovered that all along the meeting had been set for the previous Monday. "It only took me a few moments to realize that I had subconsciously decided to miss the meeting. I wasn't ready to leave the known, comfortable world of teaching to enter the competitive, intense world of business."

That startling moment of insight, however, ended up being a turning point in Tom Snyder's life. "I went back to the drawing board filled with a compulsive burst of creative energy. By the end of the week I had purchased a microcomputer and taught myself to program. Next, I transformed the three-dimensional game of Personk into a piece of microcomputer software for kids."

Snyder followed Personk with a series of educational simulations for his students at Shady Hill School covering such subjects as archeology, community, energy, geography, and geology. He and his venture capitalist partner, Jere Dykema, soon sold these programs, called "The Search Series," to McGraw-Hill. By then the fledgling entrepreneur was ready for the business world "and that time I did not miss the meeting."

Today, Tom Snyder is 32 years old, recently remarried, and the owner of an endearing old mutt name Roqueforte. He continues to teach at

the same private school in Cambridge "out of a sense of loyalty to the school and a love of kids."

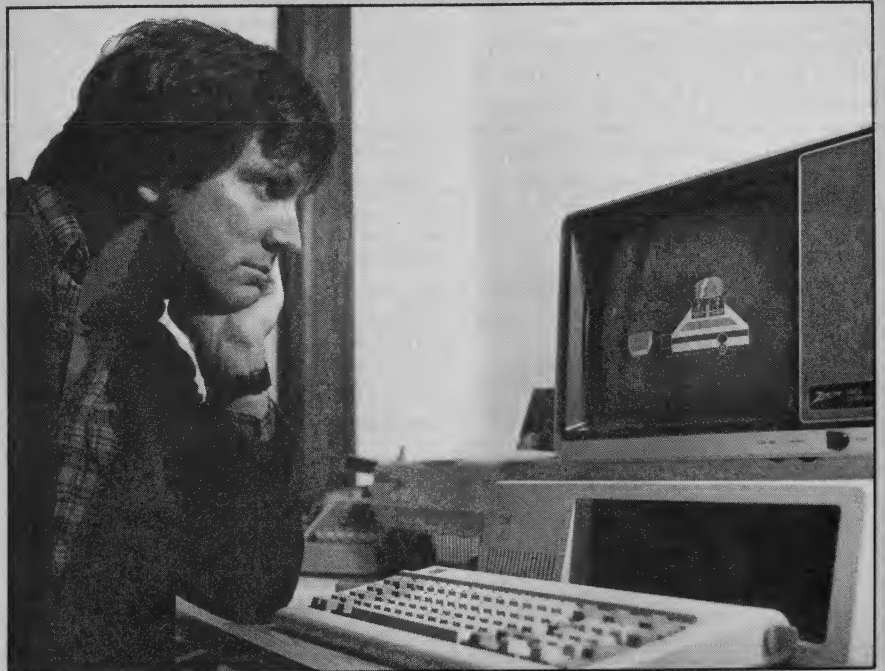
He scored a notable success in late 1982 when his *Snooper Troops I and II* became the first educational gameware for home and school computers to make the industry's bestseller list. These games, as well as the upcoming *The Most Amazing Thing* . . . , were published, marketed, and distributed by Spinnaker Software Corporation of Cambridge, MA.

While Tom variously describes himself as a design addict, programmer, songwriter, advocate for children and technology, teacher, author, and entrepreneur, he also possesses a well-deserved reputation as an avant-garde thinker in the home and educational software field. He is wary of the drill-and-practice approach to educational software. The material Tom designs reflects his belief that a classroom should be a "learning environment," a place where group dynamics and proficiency in basic reading and writing skills are more important than using a computer.

He states, "The computer is there as a servant or a tool. My goal as a teacher isn't to have the kids become CRT nerds. I prefer to have students take an active role with the computer by making them responsible for keeping track of information and having them work together in small groups. To teach a set of skills, the software must encourage kids to manipulate numbers and facts and make decisions."

Recently, Tom and several colleagues authored a book entitled *Computers in the Classroom*. His contribution was a series of vignettes "all of which have a dour sound to them because I am still very skeptical about the use of computers in classrooms."

Tom Snyder, however, has no skepticism about his own company and its products. "We want people to know that we are trying always to write the highest quality, most entertaining software possible. We're fascinated with the technology, always looking for excuses to design, and the thing that keeps us honest is our attachment to kids."



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Learning Can Be Fun, continued...

While the approach of this package is certainly pedagogically sound, we question whether it is worth \$49 to replace about 20 to 30 pages in a textbook. Undoubtedly, the computer provides a level of motivation that the textbook does not. This suggests that these packages may be most useful for remedial work or for students who have difficulty keeping their attention focused on a book.

Snooper Troops

Snooper Troops is a series of adventure detective games which help children learn to take notes, draw maps, classify and organize information, and develop vocabulary and reasoning skills. Children, did we say? Yes, but only if they can shoulder the adults out of the way.

In Case #1, "The Granite Point Ghost," we read in the instructions, "Someone is trying to scare the Kim family right out of their new home. But who? And why?"

"As a Snooper Trooper, your job is to find out. But it will take some daring detective work. You'll have to question

noon." We were then allowed to look up people facts, special messages, or old clue files. We were also allowed to make an accusation (it was a bit soon for that!) or leave the office.

We elected to leave, hopped in the SnoopMobile and paid a visit to a nearby house. We stopped at 9 Larch Street, went to the door of the house, and asked the person who answered, "Where were you the evening of April 6?" The person replied, "Are you sure you have the right place?" (this was listed as clue 896). Since we could not satisfactorily answer the question, the door was slammed in our face.

We then went around to the right side of the house and entered through an open basement window to take some Snoop Shots.

Thus started our adventure to find out who was trying to scare the Kim family out of their home and why.

Although this is billed as an educational adventure for children, we found it was quite challenging and not something that could easily be solved in 10 or 15 minutes—ten or fifteen hours might be more like it. We found it considerably easier to play with two people, since some of the clues appear on the screen for a very short period of time, and it is difficult to find the right page in the Snooper Troop Notebook to write down the clue while it is still visible. Single players may find it desirable to keep a tape recorder nearby to record telephone numbers, dates, and the like which can be copied into the notebook and analyzed later on.

The program can be stored on the disk when you want to rest and resumed from that point the next time you attempt to solve the mystery.

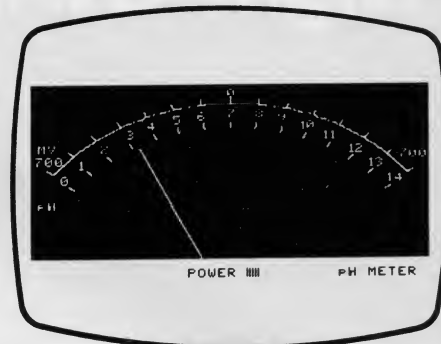
All in all, we feel the *Snooper Troop* games are exceptionally well done, highly motivational, and valuable in helping users learn to take notes and analyze relevant information. The packaging and instruction booklets are outstanding; we give Spinnaker an A+ for these packages.

Fundamental Skills for General Chemistry

About ten years ago when I was Education Product Line Manager at Digital Equipment Corporation, we were seeking high quality educational materials in different subject areas. One of our customers, Paul Cauchon at the Canterbury School in Milford, CT, showed us course notes and proposed that we compile them into a book. Thus was born the book, "Tutorial Exercises For Chemistry," one of the first of its

kind. Paul's latest book, "Chemistry With A Computer," updated and in its third printing, contains 28 programs, fully documented with sample runs, complete listings and suggestions for classroom use. The cost is \$14.95 from Programs For Learning, Inc.

However, Paul didn't stop there, but went on to gather a group of educators



in the field of chemistry dedicated to the development of computer-based instructional materials. Marketed by Programs For Learning, the packages fall into two general categories: drill and practice exercises and simulations.

The *Fundamental Skills for General Chemistry* package which we reviewed contains 12 drill and practice exercises along with a 32-page three-ring instructor's guide. The drills are presented in high-resolution graphics so that upper and lower case letters, symbols, subscripts and superscripts are all displayed "correctly." When a problem is answered correctly, a brief reinforcement message such as "very good" appears, and the next problem is presented. Should a problem be missed, a discussion of how to arrive at the correct answer is presented on the screen. This is far better than simply presenting the correct answer and going on.

The exercises are not graded in a group. It is up to the teacher to decide what an appropriate "passing" level is. The instructor's guide suggests mini-

creative computing SOFTWARE PROFILE

Name: Fundamental Skills for General Chemistry

Type: Drill and practice

Authors: Paul Cauchon, et al.

System: Apple, Pet or TRS-80

Format: Cassette or disk

Summary: Drill in chemistry

Price: \$150

Manufacturer:

Programs For Learning, Inc.
P.O. Box 954
New Milford, CT 06776
(203) 355-3452

creative computing

SOFTWARE PROFILE

Name: Snooper Troops

Type: Educational adventure game

System: 48K Apple or Atari 800, disk drive

Author: Tom Snyder

Format: Disk

Language: Basic

Summary: Adventures go educational

Price: \$44.95

Manufacturer:

Spinnaker Software
215 First St.
Cambridge, MA 02142

witnesses, uncover background information, and even search dark houses to find the facts.

"The computer program provides you with all the equipment you'll need: a SnoopMobile, a wrist radio, the SnoopNet computer, a camera for taking Snoop Shots and a notebook for keeping track of the information you uncover as you get closer to solving the mystery.

"Granite Point Ghost offers children the challenge and excitement of solving a mystery and features full color graphics and sound."

We joined the case on Tuesday in week 1. We were given Snoop license number 5 and connected with the SnoopNet computer.

It told us that "Mister X will accept a call at 357-7359 on Wednesday after-

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TABLE OF CONTENTS

Turtle Graphics	8
Applesoft Line Cruncher	14
TRAC Income System	19
MAMA	25
Amper Free Space Catalog	26
Machine Language Editor	27
Apple CALENDAR	36
Peaceful Coexistence	43
Apple Slugger	43
Reverse Key	45
Amper Find	45
Bond Manager	47
DOS 3 + 2	53
Amper Speed	57
Apple Darts	61
MicroCalc	63
Variable Cruncher	72
Life	77
Apple Flash	80
Checker	81
GO- Greeting Program	83
Quick Sort	86
Applesoft Line Editor	90
Othello	96
SPRINT	99
Disk Dump	102
Hi-Res Colors	103
Apple Record Command System	104
Apple Art Gallery	114
Game I/O Expmnt	119
Super Keypad	123
Disk Commander	125
Compare Applesoft	132
Amp-L-Soft	136
Electronic Message Center	152
The Shape	155
Disk Map	159
Apple Bowl Football	161
Apple Scroller	167
Lower Case Letters	168
Recipe Box	170
Disk Doctor	178
Quasar II	182
DOS Command Entry	189
MLE Driver	189

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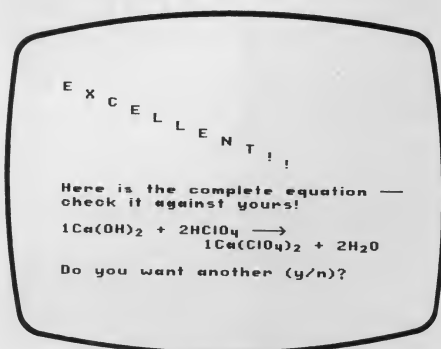
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Learning Can Be Fun, continued...

mum competency levels; for example, in the drill on balancing equations it suggests continuing until five equations in a row are balanced correctly. On the other hand, for the drill on chemical nomenclature, which requires the student to name simple chemical compounds and write chemical formulas, the guide suggests continuing until 20 questions in a row are answered correctly.

The 12 programs cover topics such as balancing equations; density, mass and volume problems; symbols, atomic numbers and electron configurations of the first 20 elements; exponential notation; symbols and charges for common ions; computing formula weights; and names and symbols of elements.

We also tried some simulation programs from the *Acid-Base Chemistry* and *Basic Electricity* packages. The simulation programs demonstrate various principles or processes by letting the user see



“what will happen if” certain steps are taken or particular conditions established.

Such programs are very useful in preparing for laboratory experiments and possibly even for replacing an experiment which cannot easily be performed in the lab. Having been away from a chemistry lab for more than 20 years, I probably should not have tried to analyze an unknown acid sample in the most efficient manner, since I barely remembered the word *titration* much less how to do a titration analysis. Nevertheless I had good fun even though the computer charged me 20 cents each time I had to refill the buret. I wound up taking about seven times as long to complete the experiment as the computer estimated it ought to have taken.

All in all these programs are very well done and should be welcomed by chemistry instructors at the high school and beginning college levels.

Chem Lab Simulations

Four *Chem Lab Simulations* have been developed by J. Gelder, a chemistry professor at Oklahoma State University.

Although developed for the college level, the material in simulations 1 (titrations) and 2 (ideal gas law) are probably suitable for a high school level also. Simulations 3 and 4 covering calorimetry and thermodynamics are probably best left for college level students. All except simulation 2 are available for the Atari as well as the Apple. However, because the second simulation makes the most effective use of graphics, we chose to review it here.

Chem Lab 2 is designed to illustrate the ideal gas law, the kinetic-molecular theory, and the principles of diffusion. In the first part, the ideal gas law, $PV = nRT$, is illustrated. The ideal gas is represented on the screen as colorful (orange) particles bouncing and colliding with each other in space. The color of the particles, background, and piston may be changed if you desire. As the pressure, volume, temperature, or number of gas moles is varied by the user, the effect on the other three parameters and on the behavior of the gas is shown immediately. Temperature is varied with the potentiometer on paddle 1, the number of moles is varied using the numeric keys 1-9, and volume and pressure are varied with the paddle buttons. The bottom of the screen displays in numeric terms, the pressure, volume, moles, and temperature. Of course, an increase in temperature is also shown on the main part of the screen as the particles move faster and collide more frequently. This also occurs as a result of decreasing the volume, which increases the pressure. This is shown on the screen display in



the form of a large piston on the right which compresses the amount of free gas space.

The comprehensive 32-page manual contains 14 exercises on the ideal gas laws including Boyle's Law and Charles's Law, three exercises on kinetic-molecular theory, six exercises on the mixing of two ideal gases, and four exercises on the expansion of an ideal gas.

The programs are well written and have good error trapping routines. Incorrect input is ignored although you may be scolded for not entering data

creative computing SOFTWARE PROFILE

Name: Chem Lab Simulations

Type: Educational simulation

Author: J. I. Gelder

System: 48K Apple, paddles,
32K Atari 800

Format: Disk

Summary: Great graphics and action

Price: \$100

Manufacturer:

High Technology Software
P.O. Box 14665
Oklahoma City, OK 73113
(405) 840-9900

that you should have noted. Since there are upper and lower limits to the acceptable range of pressure, volume, moles, and temperature, the results are likely to be realistic and similar to those that would be achieved with laboratory apparatus. The big difference is that you can't blow up the lab with this disk.

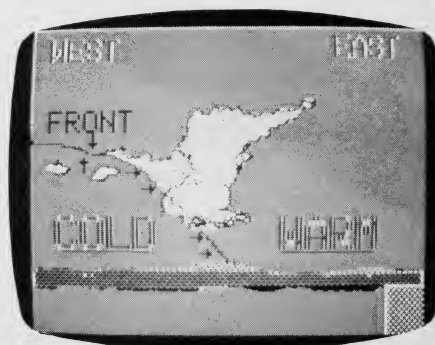
Weather Fronts

Weather Fronts is one in a series of “lesson-tutographs” from TYC (Teach Yourself By Computer) Software. The disk is accompanied by a six-page booklet which explains the contents of the disk, suggests classroom uses, and lists the 24 tutorial and 10 test questions (with answers) that are contained on the disk.

Upon loading the disk you are presented with three options: tutorial, test, or review.

The tutorial section offers a programmed learning presentation of the material covered by the lesson. As the program proceeds, you are quizzed on your understanding of the material presented. In general, two questions are displayed after each screen of text or graphic material.

If you answer a question incorrectly, the program branches to an alternate display of the same material. You are then given another question covering the



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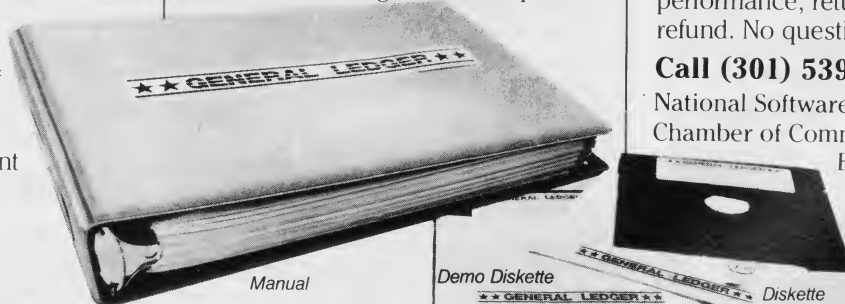
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same topic but phrased differently. If you again answer incorrectly, the text and question are repeated using the original wording.

All questions are multiple choice. Upon giving a correct answer, you always receive the same message of "Congratulations (your name). Press space bar to go on."

The graphic illustrations of weather fronts are excellent and make good use

creative computing

SOFTWARE PROFILE

Name: Weather Fronts

Type: Educational tutorial

Author: Patrick C. Moyer

System: 48K Apple

Format: Disk

Language: Machine

Summary: Learning about the weather

Price: \$24.95

Manufacturer:

TYC Software

40 Stuyvesant Manor

Geneseo, NY 14454

of animation and pointers. Since they use color extensively, we recommend a color monitor or TV set for this package.

The test is graded and you may use it as a pre-test, post-test, or both. After completing the test, you receive a percentage grade. In addition, you are informed of the screens of text and illustrations that would be most appropriate for review based on your test results. For example, based on my score of 80%, I was told I might want to review screens 4, 5, 10, and 11 and figures 4 and 5.

Text and illustrations may be reviewed using the third option on the disk. This allows you to access randomly any screen of text or illustration from the tutorial.

I have been away from programmed instruction since doing my Ph.D. work at Pitt in 1968. However, it hasn't changed much in 15 years. It is boring but reliable. After all, if the Army can train helicopter pilots using programmed instruction with a requirement that 100% of the graduates attain 100% mastery of the material, you get some idea of its efficacy.

In *Weather Fronts*, Moyer has taken the well-proven programmed instruction approach, put it on the Apple computer, and added some nice, colorful graphics. It takes about 20 to 30 minutes to complete the disk. There is no doubt that upon so doing you will know the structure, characteristics, and weather associated with cold, warm, occluded, and stationary fronts.

Tell Star

Tell Star is an astronomy program which shows the location of stars and planets for any location on earth during the late 20th century. The program displays a portion of the sky 90 degrees wide facing in any of eight directions, N, NW, W, SW, etc. or directly overhead. The display is very accurate, generally within 15 seconds of arc. To achieve this accuracy, the program takes into account factors such as the precession of the earth in a somewhat lengthy five-minute calculation.

Pressing C causes the constellations in your field of view to be drawn. The program can also locate any star or planet (at least those listed in the tables with the program) by means of a blinking cross hair. Pressing any key displays information about the object such as magnitude, right ascension, declination, rising time, and setting time. You can also move the cross hair manually with the game paddles or joystick and obtain information about any stellar object on the display.

A calculation program is included on the *Tell Star* disk to convert equatorial coordinates to horizontal and vice versa, and to convert ecliptic to equatorial. It is also possible to calculate the location of objects in the solar system without going to the display portion of the program.

The program is available in two versions: standard and advanced. The advanced version has two sets of star tables plus an additional table containing stars and stellar objects for the southern hemisphere. The Level I tables list about 180 stars and 13 Messier objects; the Level II tables have fewer stars but nearly 90 Messier objects.

An extensive 48-page tutorial manual is included in the package. An appendix has the star tables mentioned above. *Tell Star* is an excellent program for the serious student of astronomy as well as for amateur and professional astronomers.

creative computing

SOFTWARE PROFILE

Name: Tell Star

Type: Educational tutorial

System: 48K Apple

Format: Disk

Language: Machine

Summary: Predict star and planet locations

Price: \$39.95 and \$79.95

Manufacturer:

Information Unlimited Software

281 Arlington Ave.

Berkeley, CA 94707

(415) 525-9452

Understand Yourself

Remember the Creative Computing disk, *Know Yourself*, with five self-analysis programs? Well, Huntington has gone Creative one better, or should we say four better? This disk contains nine comprehensive tests to help you better understand yourself. They test assertiveness, conscience, manipulation, marital adjustment, personal adjustment, preferred activities, sexual attitudes, and your individual scale of values, and end with a personal equation test.

Each test includes between 10 and 100 multiple choice questions. Before and after each group of questions is some general discussion which presents, in very general terms, some background information on, for example, assertiveness or conscience. While the disk refers to the series of questions as tests, they might more properly be called profile, opinion, or attitude questions.

You do not pass or fail tests of this sort. Rather they give you an idea of how your profile compares with some norm or statistical sample. If you are

creative computing

SOFTWARE PROFILE

Name: Understand Yourself

Type: Psychological self-analysis

Author: Harry Gunn and Mike Taylor

System: 48K Apple

Format: Disk

Language: Machine

Summary: Lots of questions

Price: \$24.99

Manufacturer:

Huntington Computing

P.O. Box 1297

Corcoran, CA 93212

honest while answering the questions, and there is no reason not to be, you may well gain some valuable insight into your attitudes, values, and psyche.

And if that isn't reason enough to buy the disk, you ought to have it for your next party. Just watch which people avoid taking the tests of marital adjustment and sexual attitudes. All in all, the disk can provide some valuable insight as well as good clean fun.

Lovers or Strangers

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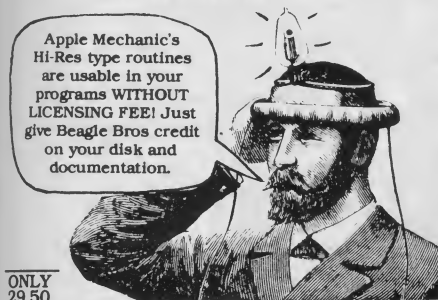
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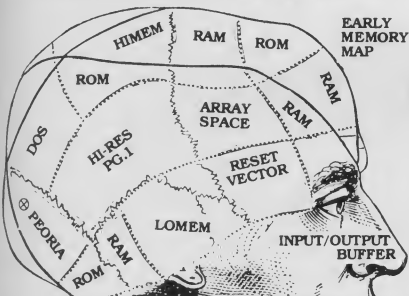
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Learning Can Be Fun, continued...

Or Strangers evaluates how compatible you two are in the following areas: communication, love and romance, values, sex, work and money, spirituality, and play.

"*Lovers Or Strangers* also tells you how well you know each other, by letting you guess what your partner answered on each of the questions."

Although *Lovers Or Strangers* had arrived much earlier for review, it was not until a blustery Saturday afternoon some weeks later that we finally got around to it. Betsy had been editing a mound of manuscripts and I had been reviewing educational software packages. While we are perhaps not the ideal subjects for analysis by this program, we felt that after working together for four years we knew each other reasonably well and could probably give the program a fair evaluation.

The instructions contained on the disk show you how to answer the questions.

All the questions are multiple choice and the person sitting on the left uses keys 1-5 for his answers while the person on the right uses keys 6-0 for his answers.

The test consists of 30 questions drawn from a 60-question data bank, so you get a different test each time. On each question, *Lovers Or Strangers* asks you first to select an answer for yourself and then to guess what your partner answered.

The answers do not appear on the screen, but there is a temptation to look over and see which key your partner is pressing. The instructions suggest placing a 3 x 5 piece of paper down the center of the keyboard, wedged in between the keys, but we found that holding one hand over the other was equally satisfactory.

Each question has five answers from which to choose, and there are fifteen different scores possible for each question. For example, if you both choose the same answer, you get a 10-point match. If you choose similar answers you get fewer than 10 points, whereas if you select dramatically different answers, a negative value is assigned to compatibility on that particular question.

At the end of the test, a graph shows how you and your partner did in each of the seven areas mentioned above. In addition, there is a short analysis of how well you know your partner and a recommendation about finding out how your partner feels about certain things. The results can be printed out if you wish.

The program was good fun to play, and the results were interesting and even surprising (at least to one of us). I don't know if using it 20 years ago would have

saved me from a divorce, but for an investment of \$29.95, it certainly wouldn't have hurt. ☐

ANALYSIS FOR DAVE AND BETSY

HERE ARE YOUR RESULTS BY AREA:

	PERFECT OPPOSITES	PERFECT MATCH
COMMUNICATION*	54%
LOVE & ROMANCE*	76%
VALUES*	66%
SEX*	59%
WORK & MONEY*	53%
SPIRITUALITY*	65%
PLAY*	63%

HERE'S HOW WELL YOU SEEM TO KNOW EACH OTHER:

DAVE, YOU CORRECTLY GUESSED BETSY'S ANSWER 43% OF THE TIME, WHICH INDICATES AN AVERAGE UNDERSTANDING OF BETSY.

YOU SEEM TO KNOW BETSY PRETTY WELL IN THESE AREAS: COMMUNICATION, LOVE & ROMANCE, SEX, AND SPIRITUALITY.

YOU COULD BENEFIT FROM FINDING OUT HOW BETSY FEELS ABOUT THESE AREAS: VALUES, WORK & MONEY, AND PLAY.

BETSY, YOU CORRECTLY GUESSED DAVE'S ANSWER 34% OF THE TIME, WHICH INDICATES AN AVERAGE UNDERSTANDING OF DAVE.

YOU SEEM TO KNOW DAVE PRETTY WELL IN THESE AREAS: VALUES, AND SPIRITUALITY.

YOU COULD BENEFIT FROM FINDING OUT HOW DAVE FEELS ABOUT THESE AREAS: COMMUNICATION, LOVE & ROMANCE, WORK & MONEY, SPIRITUALITY, AND PLAY. AND HERE'S YOUR FINAL RESULTS:

DAVE AND BETSY, YOUR OVERALL COMPATIBILITY RATING IS 62%.

YOU TWO HAVE SOME SIMILARITIES THAT COULD FORM THE BASIS FOR A GOOD RELATIONSHIP, SPICED WITH A FEW DIFFERENCES.

creative computing SOFTWARE PROFILE

Name: lovers Or Strangers

Type: Game?

Authors: Al Byers and Annette Long

System: 48K Apple

Format: Disk

Language: Machine

Summary: Evaluate compatibility

Price: \$29.95

Manufacturer:

Alpine Software
2120 Academy Circle, Suite E
Colorado Springs, CO 80909
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VisiOn

creative computing

SOFTWARE PROFILE

Name: VisiOn

Type: Integrated, menu-driven business software

System: IBM PC, 256K RAM minimum, a graphics adapter and a hard disk.

Format: Disk

Language: Assembly and "C" languages.

Summary: VisiCorp's answer to the Xerox Star and Apple Lisa. Surprisingly easy to learn and operate.

Price: To be announced.

Manufacturer:

VisiCorp
2895 Zanker Road
San Jose, CA 95134
(408) 946-9000

Back in 1978 a tiny company, Personal Software, sparked a revolution in micro-computing with the introduction of an electronic spreadsheet it called *VisiCalc*. Now, five years after making "What if..." famous, this company (renamed VisiCorp) is attempting another coup with a package of software and hardware dubbed *VisiOn*.

VisiOn promises to give personal computer owners many of the features

Ron Jeffries

boasted by the high priced Xerox Star and the new Apple Lisa. All three systems provide an entirely new way to operate computers. Each is menu-driven, offering lists of possible actions. You simply point

Apart from simplicity and ease of use, an important feature of VisiOn is that user experience can be transferred from one program to another, and from one machine to another.

to what you want to do by using a device called a *mouse* that tracks the motion of your hand. Then you press a button on the mouse to indicate a selection and start working. For many computer owners it will be like trading in a clumsy stick shift for a silky automatic transmission.

To use *VisiOn* on the IBM PC, the computer on which we tested it, you need a minimum of 256K RAM, a graphics

adapter, and a hard disk. However, any additional memory should improve the performance of *VisiOn* noticeably. (Many *VisiOn* systems will have as much as 512K RAM.)

What Does VisiOn Do?

VisiOn provides a simple, menu-oriented way to use your computer. Rather than requiring that you memorize lists of commands and complex syntaxes, *VisiOn* lets you indicate what you want by pointing a small arrow on the screen to various items on the menus. The arrow is controlled by moving the small, plastic mouse. A thin wire connects the mouse to a standard RS-232 serial interface on the PC. Inside the mouse are electronics that sense the movement of your hand and transmit the change in location to the computer.

VisiOn is intended to be used by office workers, the people VisiCorp President Terry Opendyk calls "paper-pushing knowledge workers." It is designed to be both easy to learn and easy to use. There is an important distinction between the two, since some products that are easy to learn become unbearably tedious by the time you become familiar with them. On the other hand, some users have found the more popular word processing programs difficult to learn, but extremely simple to operate once mastered. *VisiOn* is an attempt to provide both easy learning and efficient production capabilities.

VisiOn is designed to be used with a wide range of computer hardware and operating systems. Once you learn how to use a spreadsheet program under

Ron Jeffries, 5266 Hollister, Suite 224, Santa Barbara, CA 91311.

VisiOn users can perform interrelated tasks on the same screen. In this sequence spreadsheets are merged, their totals plotted, and a memo written to discuss the results.

VisiOn with one machine, you will know how to use it on any other computer that supports VisiOn. Apart from simplicity and ease of use, an important feature of VisiOn is that user experience can be transferred from one program to another, and from one machine to another. Naturally, this benefit will occur only if VisiOn is widely adopted, by both hardware and software firms, and is well received in the marketplace.

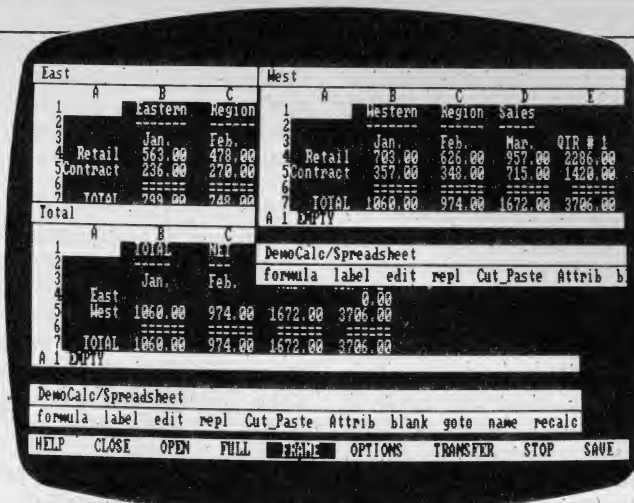
VisiOn has not been released, but has already generated considerable interest. The crowds at VisiCorp's booth at the recent computer show seemed enthralled by the VisiOn demonstration. Digital Equipment Corporation (DEC), the second largest computer maker, has

VisiOn will probably not force you to use the mouse when the keyboard would be more convenient.

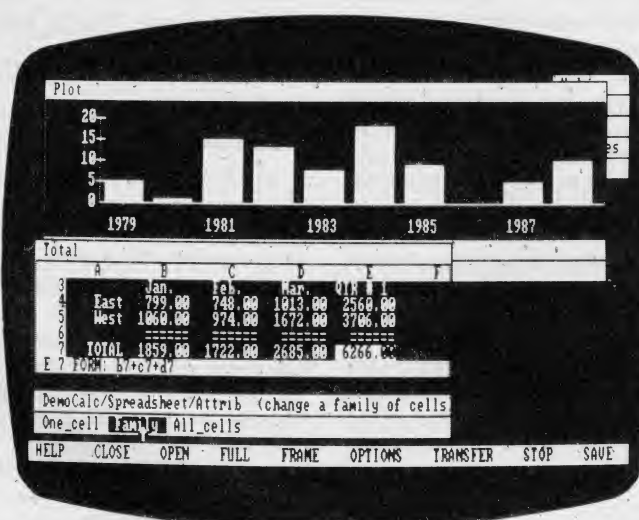
announced its support for VisiOn on the DEC Professional series. If IBM decides to offer it for the PC, it will almost guarantee that VisiOn will become an industry standard. Unfortunately, you will probably have to wait a month or so before finding VisiOn in your local computer store.

What you see on the screen when using VisiOn is a representation of the top of an ordinary desk. However, unlike the Xerox Star and Apple Lisa, VisiOn does not use small pictures (sometimes called icons) to identify various actions or objects. Since the current IBM graphics adapter lacks sufficient resolution, VisiCorp felt there wasn't enough detail to use such icons effectively. Instead, VisiOn uses conventional text descriptions. As you move the mouse to control the cursor, each action you select is displayed in reverse video. It is always clear both where the cursor is on the screen, and which command or option is about to be selected.

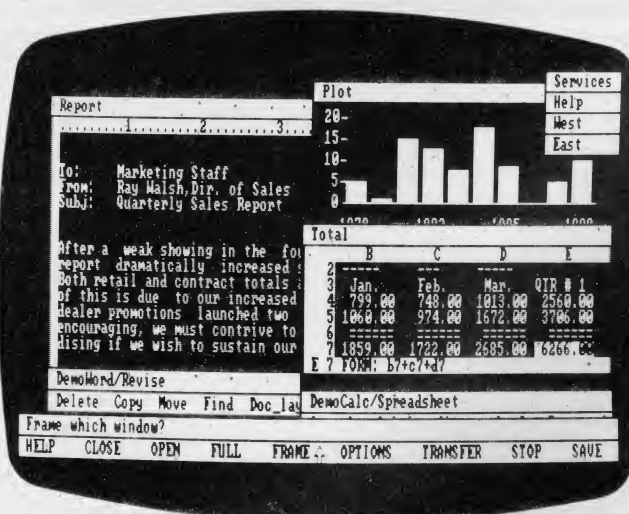
Several things appear on the VisiOn screen at the same time, much as you might have overlapping pieces of paper on the desk. The screen initially displays



Two spreadsheets (labeled East and West at the top of the screen) are consolidated into one in the middle of the screen, that gives the total. Note that "West" is the active menu.



Data can be displayed in a variety of ways. In the upper right corner of the screen, spreadsheet totals have been transformed into a bar chart.



Three VisiOn windows are displayed simultaneously in typical application: a memo in the background is combined with a spreadsheet and a bar graph.

VisiOn, continued...

a "clean" desk top when you turn the system on. The bottom line of the screen lists the nine *VisiOn* commands: Help, Close, Open, Full, Frame, Options, Transfer, Stop, and Save. A list of the various tasks that can be performed is shown in the upper-right corner of the screen.

To select an application program such as a word processor, you roll the mouse across the surface of your own desk; a small arrow on the screen duplicates the movement of the mouse. If you move the mouse to the right, for instance, the arrow moves to the right. When the arrow is positioned over the name of the program you want to use, you press the Select button on the mouse, and the system automatically loads and readies the program.

What's the Keyboard For?

A natural question about mouse-oriented systems is how the keyboard is used. Some of the finer points of how *VisiOn* will use the keyboard are still being worked out. But the philosophy is clear: every key has only one purpose: to deposit a character (such as the letter A) or to perform a single, specified function. Even though the mouse is a handy way to point to things on the screen, there may be times when using the cursor control keys would be easier, such as for character-by-character editing within a word processor. *VisiOn* will probably not force you to use the mouse when the keyboard would be more convenient. As Opendyk puts it, "We are not fanatics about the mouse. *VisiOn* is designed to be used with any x,y pointing device."

Integrated Help

If you run into trouble while using *VisiOn* or any of its applications products, there is a Help system that provides a complete network of information about

each function. For example, if you do not understand how to use an option in the plot program, you can display the help menu for plotting on a blank area of the screen, with the plot that you are working on still in view.

This integrated Help system is an excellent feature. It is available at every level. From broad, general descriptive information that helps you understand the big picture, down to details about specific options. Such hand-holding is costly (it is also one reason *VisiOn* requires a hard disk), but the increase in productivity should be well worth the extra disk storage.

When you need to look at several things at once, VisiOn is unbeatable.

VisiOn lets you do more than one thing at a time. Here again, the analogy to an ordinary desk in an office is appropriate. At a regular office desk, you might be interrupted by a phone call while writing a memo. While you are talking on the phone, you might grab your desk calendar and make an appointment to see a client for lunch on the following Monday. As you use the calendar, it may temporarily cover the memo you were working on before the phone call. When the call is over, you put your calendar back in its place and continue writing the memo.

When you were interrupted by the phone call, you temporarily attended to another task (making an appointment) and then returned to what you were doing

earlier (writing the memo). You did not continue writing the memo and make the appointment in the desk calendar at the same time. This is exactly how *VisiOn* works; it lets you have several activities "on your desk" at one time, each shown on its own window; but you use only one window at a time. This "active" window displays the task upon which you are currently focusing.

Just as you might consult a dictionary, use a calculator, or look up an address in your Rolodex file while writing a memo, you are free to structure the appearance of your *VisiOn* desk any way you choose. You might want to have a spreadsheet open and at the same time have a window of help information in front of you listing the directions for entering a formula. However, at any given moment, you are actually using only one window at a time.

The optional *VisiOn* command, Full, expands a particular window to fill the entire screen. I haven't used the system long enough to form an opinion, but my guess is that most people will prefer to work with a single window much of the time. But when you need to look at several things at once, *VisiOn* is unbeatable.

VisiOn lets you display several windows on the computer screen at once, and lets you have several programs simultaneously available for instant use. However, you may have only one window "active" at a time. You can switch back and forth between windows, alternately making each active. But when one window is active, all others are passive. There are exceptions to this rule. The system supports a print spooler so the printer can type a letter while you are entering new information into a spreadsheet. Later versions are expected to support a local network that will operate at the same time that the user is doing other things at the keyboard.

Even when several windows are open at once, they are never automatically linked. For example, if you have a plot window open, and display some spreadsheet data graphically, the plot will reflect the data at that moment. If you then go back and change some of the numbers in the spreadsheet, the plot is not changed to reflect the new numbers until you transfer the new data from the spreadsheet to the plot. VisiCorp says that an automatic link among windows may be incorporated into future releases.

Moving information is so important that it is one of the nine basic *VisiOn* commands; data can be transferred easily from one window to another. When the transfer command is selected, you are asked to point to the window containing the data to be moved. You then use the mouse to show the system how much of the window to copy. Finally, you point the mouse to the window where the data



is to go. The entire procedure is natural, and I remembered it easily after being shown how just once.

VisiOn handles the transfer of data between programs in a clever way. It attempts to preserve as much of the context of the data as possible. For instance, if it is moving data from one spreadsheet to another, it will preserve everything it already knows about the columns and rows of figures. But if it has to transfer data from a spreadsheet to a word processing document, all it will do is move the numeric text to the target document. This "type checking" helps prevent errors that could arise if you asked it to do nonsense operations, such as use a letter to your mother as the input data for a spreadsheet.

Scripts: A Way to Build Macros

Another interesting *VisiOn* feature allows you to predefine a series of operations. By selecting Script mode, you can record a series of *VisiOn* commands and options in a file that can be stored for later use. Called "macro expansion" in other systems, this lets you perform a complex, multistep operation just once, then have the system run through all the steps for you automatically whenever you want, at the touch of a button.

I saw *VisiOn* demonstrated with a three-button mechanical mouse. However, the operator used only two of the buttons, one to select an item, the other to scroll. VisiCorp hinted that it preferred optical mice because they are more reliable and less expensive than their mechanical cousins.

After seeing *VisiOn* demonstrated, I was able to spend only a few minutes actually using the system. When I say a few minutes, this is not a figure of speech. For whatever reasons, VisiCorp did not seem comfortable letting me use the system for an extended period of time. They were very friendly and helpful, but surrounded me with four staffers who

seemed anxious that I wrap things up and get back on the plane. My hunch is that while most of *VisiOn* itself is working, there are probably holes in the system, since it is still under development, as are its various applications products. And the longer I sat there, the more likely I was to find a problem. Keep in mind that my reactions to *VisiOn* are based on a brief demonstration, and a limited amount of actual hands-on experience with the system. A full evaluation will appear in *Creative Computing* magazine later this year when the system is released.

I found the *VisiOn* mouse harder to use initially than I had expected. At first, I found it somewhat difficult to point the cursor arrow at the correct menu item. But after a few minutes of practice, I got used to the feel of the device. I was also

I found the VisiOn mouse harder to use initially than I had expected.

surprised by the distance I had to move the mouse to select some of the options. A quick check indicated that moving the mouse eight inches on the table surface moved the cursor arrow across the width of the screen. Sometimes I had to lift the mouse up and reposition it to have enough room. Since the mouse and the software were both pre-production, I imagine that these details will be worked out before the product is released next summer.

The ratio of mouse movement to the movement of the cursor on the screen is something that different users may want to adjust. Some will require more precise on-screen movements than others, while some may have less tabletop area on which to roll the device. Some clever

compromises are possible, such as changing the ratio of screen-to-mouse movement in proportion to the speed of mouse travel. In such a scheme, a small movement, such as selecting between two adjacent menu items, would require a fair amount of hand motion. However, a quick jump from the bottom to the top of the screen would take only a bit more movement.

Four Layers of Software

Four layers of software are involved when an application program is used on a *VisiOn* system. At the bottom level is a standard operating system, such as DOS. The second layer is *VisiHost*, which extends the operating system by implementing over 140 additional system calls for use by *VisiOn*. Just above *VisiHost* is *VisiOn*, which is the first layer the user sees. The fourth level is the application program—a spreadsheet, word processor, graphics package, or database manager.

VisiHost provides the interface between *VisiOn* and the operating system. When *VisiOn* is transported to new hardware or a different operating system, the only part that has to be changed is *VisiHost*. Both *VisiOn* and the applications that run under it are completely unaware of the underlying operating system and hardware configuration.

Largely Written in C

According to group manager Bill Coleman, about 60 percent of the PC version of *VisiHost* is written in assembly language, with the remainder written in C. *VisiOn* however, is written entirely in C, as are all the applications programs. This heavy use of C will help VisiCorp a great deal when it comes time to translate the software to other computer systems that use different processors. In such a case, the *VisiHost* assembler would be extensively changed. But once *VisiHost* is working in the new environment, the rest of *VisiOn* and its application packages can be transferred with little additional effort.

The use of C for systems level software is not new. The Unix operating system is written almost entirely in C, and as a result has been ported to many different computers. C is a good choice because it was originally designed specifically for systems programming. It is a middle-level language that lets the programmer get close to the machine level, yet is far easier to write, debug, and maintain than ordinary assembly language.

When software is written in C, all that is needed to transport the software to a new machine is a compiler that generates code for the new computer. While writing a new C compiler or modifying an existing compiler requires significant work, it is work that must be done only once. On



VisiOn, continued...

the other hand, if programs are written in assembler, each program must be recoded for the new machine.

The VisiCorp people seem eager to avoid the impression that they are getting into the operating systems business. More than once during my interview the topic was raised, and each time there was an emphatic response that they were not interested in writing operating systems and never intended to get into that area.

When you look at the specifications for VisiHost, the dividing line between it and a regular operating system is thin. True, VisiHost uses many of the services of the underlying operating system, including its file system. VisiHost imposes its own structure on an operating system file so that you can look at *VisiOn* file names using a standard operating system command such as DIR on the PC. However, you won't be able to use these files other than with *VisiOn* programs. From what I understand of VisiHost, it may add more system calls to a given operating system than were available in the first place. Is VisiHost an operating system? I guess not, since VisiCorp says it's not.

VisiHost extends an operating system by supporting new system calls or primitive features that *VisiOn* can use. For example, it supports an elegant method of managing memory which is similar to what is known as "virtual memory." Although VisiCorp uses standard, off-the-shelf C compilers, the company has developed its own linker. VisiCorp clearly has

VisiHost supports an elegant method of managing memory.

the talent and skill to build an operating system, but it has decided for business reasons to work with other operating systems developers instead. Given the current battle among the various operating systems in the micro world, this is probably a wise decision. If *VisiOn* becomes a *de facto* user interface standard, VisiCorp will clearly have the last laugh.

VisiOn manages the handling of windows on screen that makes it look as if one piece of paper is on top of another. While it treats the screen as a bitmap, the application programs that run under its control do not have to worry about any of this. The application program simply hands text to *VisiOn*. This means that application programs can be easily converted to work in the *VisiOn* environment. Even more important, the applica-

History of Micro Mouse

The *VisiOn* project began in early 1981. A small team of people started talking about how the ideal user interface should work. Then in August 1981 they wrote four complete specifications for a proposed system. They finally decided on a design similar to the current *VisiOn* package, and started writing a prototype system.

In an odd twist of fate, the *VisiOn* prototype was developed on the only easily available personal computer that met their performance requirements, the Apple III. This is especially ironic, since at the same time Apple was hard at work designing Lisa, which uses a user interface that resembles *VisiOn*. Eventually, *VisiOn* may cause headaches for Lisa, since *VisiOn* provides many of the features of Lisa at a considerably lower price.

By late November 1981, the prototype of *VisiOn* was working, and was shown to a few selected hardware companies. Based on the positive reaction, a major development project was launched in early 1982 to build the production version of VisiHost and *VisiOn*. By early December 1982, the system was far enough along to demonstrate on an IBM PC at Comdex.

Since VisiCorp does not plan to release this package until sometime in

the summer of 1983, industry observers have speculated about why the company announced *VisiOn* so early. It seems likely that there were two closely related reasons: Apple's Lisa and the 1-2-3 software package from Lotus. (VisiCorp knows how talented Mitch Kapor, the author of 1-2-3 is, since it bought its *VisiTrend* and *VisiPlot* software from him.) By announcing *VisiOn* early, VisiCorp was able to reduce the impact of the other two products. It is possible that IBM was also eager to have the world find out about *VisiOn*, since it makes the IBM PC much more competitive with the intriguing new Lisa.

VisiCorp may have been nervous about the Lotus 1-2-3 since it could threaten *VisiCalc*, which is the heart of VisiCorp's business. 1-2-3 attempts in a different way to integrate a calc program with plotting and database management. It was written in assembly language especially for the IBM PC. As soon as both *VisiOn* and 1-2-3 are available, it will be interesting to compare performance. Although 1-2-3 may have somewhat faster performance, *VisiOn* and its associated software products will be more portable to other computers and operating systems.

tion program is completely isolated from the quirks of specific hardware/operating system configurations. This clean division of responsibilities between the application program and *VisiOn*/VisiHost may be one of the best features of the entire system. It allows a software developer to take advantage of portability while still retaining a highly interactive user interface.

Benefits of a Common Interface

In a large organization, the common user environment provided by *VisiOn* could result in significant cost savings. For example, a given spreadsheet program would work exactly the same on an IBM PC running PC DOS as on a DEC VAX 11/780 running the Xenix operating system, if *VisiOn* were supported on both machines. When I asked the people at VisiCorp whether they planned to support Unix, they smiled. It turns out that almost all the *VisiOn* development was done using Unix on a VAX.

The consistent *VisiOn* interface helps you learn how to work with new application packages. With today's operating systems and software, the rules about how to accomplish common tasks often change from one environment to another. Within DOS for example, the command

to display the disk directory is DIR. But if you type DIR while in Basic, you will get a Syntax Error message. In Basic, you must give the command FILES, and then you get somewhat different information in a different format than that provided by DIR. There are many such differences between the operating system level (DOS) and Basic. The important point is that what you learn about DOS isn't much help when you enter the world of Basic, or other application programs.

How VisiOn Will Help Software Vendors

Software developers should also benefit from any wide adoption of a *VisiOn* standard. First, anything that is good for users is ultimately good for software developers, because new developments encourage more people to use computers, which expands the market. Second, the consistent user interface lets the developer concentrate on solving the specific application problem, without taking time to design yet another user interface. Put another way, the developer becomes responsible for the content and style of interaction, but is able to use the method of interacting. This sharing of techniques also simplifies the preparation of user documentation, since it is fair to assume

that a *VisiOn* user knows how to use a mouse, for example.

Since *VisiOn* treats the screen as one big bitmap, it has to do extensive work every time it scrolls a line of text or changes the display. This means that the speed capacity of the 5MHz 8088 processor is a bottleneck for *VisiOn*. In the brief time that I was able to use the prototype system, it was obvious that a faster processor would make *VisiOn* much more pleasant and productive to use. If IBM releases a faster version of the PC—perhaps one that uses the Intel 186 or 286 processor—the effect on products such as *VisiOn* will be remarkable.

Another improvement would be specialized hardware support for so-called BITBLT (bit block transfer). The ideal solution would be a faster central microprocessor and special hardware that would support the fast, easy manipulation of bit-mapped graphic images.

VisiOn uses three cursors: a standard arrow, which shows the current location on the screen; a four-headed arrow when scrolling; and a stylized hourglass when performing a time-consuming operation. The *VisiOn* cursor symbol performs time-consuming magic. It takes the screen image that would normally be at the cursor location and stores it away, then draws the cursor symbol. This ensures that the *VisiOn* cursor will be clearly visible, regardless of the background image. If the graphics hardware supported independently movable graphic objects (often called sprites), this overhead for displaying the cursor symbol would be reduced to almost nothing. Ironically, inexpensive home computers such as the Texas Instruments 99/4A and the Commodore 64 provide hardware support for sprites. Unfortunately, IBM PC does not offer this support.

Up and Away With VisiCorp

VisiOn represents a new direction for VisiCorp, a company that made its mark early by aggressively marketing and supporting *VisiCalc*. Since *VisiCalc* was available only on the Apple for quite some time, industry experts have credited *VisiCalc* for many early business sales of Apples.

VisiCorp is a fast-growing software company. It has grown from three employees and a third floor walkup office to over 200 employees, and 60,000 square feet of office space. Another 45,000 square feet is devoted to manufacturing and warehouse activities. VisiCorp offices teem with micros—about 1.5 computers per person!

At VisiCorp, many of the personal computers are connected to two VAX 11/780 minicomputers. Programmers write code using a text editor on the personal computer, then send the program to the VAX to be compiled. The object code is sent back to the personal computer where it is tested in the environment in which it will eventually be used.

Each night, the VAXs are kept busy controlling an elaborate software testing program. They have captured the actual keystrokes for thousands of operations of products such as *VisiCalc*. As programs are improved, they are run against all the stored tests, and the output is compared with known results. By using the VAX to control such tests running on many machines, they are able to perform between 200,000 and 300,000 comparisons in a single night.

What Next?

The *VisiOn* design does not represent the ultimate user interface for computers. However, it is very good, and has a rea-

sonable chance of being widely accepted. If IBM chooses to give its blessing to *VisiOn* by directly marketing it for the PC, *VisiOn* will probably be assured of success. Since other manufacturers will also be anxious to capture some of the market that Apple is trying to attract with Lisa, it seems likely that many of them will choose to support *VisiOn*.

The reaction of the major operating system companies, such as Microsoft and Digital Research, should be interesting. They may decide to implement the basic ideas behind *VisiOn*, rather than licensing

VisiHost to bundle with their operating systems. There have been persistent rumors of a "visual shell" that Microsoft is said to be working on as the interface to both MSDOS and Xenix.

There is no question that the mouse will become a popular way to move a cursor and select items from a menu. It is too soon to say whether *VisiOn* will become the standard, or will instead be one of several competing user interfaces. Much depends on how soon it is released, how many computer manufacturers and software publishers adopt it, and how Digital Research and Microsoft react.

VisiOn looks like an exciting product that could have a major effect on the industry. The most important question right now is, "When will VisiCorp be ready to start shipping the finished product?" When I visited VisiCorp in late January, I saw what looked like a functional *VisiOn*. Company executives say that *VisiOn* is about 99 percent complete, and that most of their effort is going into upgrading products such as *VisiCalc* and *VisiWord* that run in the *VisiOn* environment.

VisiOn looks promising. It will be even better when it is a real product on your dealer's shelves. □

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TK!Solver from Software Arts

When Dan Bricklin and Bob Frankston, creators of *VisiCalc*, decided to go it alone, it created quite a stir in the business press. *Business Week*, *Fortune* and other magazines all did stories describing and speculating about their fledgling company, Software Arts.

Buoyed by the phenomenal success of *VisiCalc*, Software Arts is off to a flying start. During a visit to their cramped offices on the 12th floor of one of the few high rise buildings in Cambridge, MA, one of the first things that Dan showed me were the architectural plans for a 20,000 sq. ft. facility in Newton, MA. Bob Frankston was quick to point out that their "new" 60-year old building had a dock along the Charles and could be reached by canoe from Cambridge in about 40 minutes.

I remarked that when Creative moved into its 25,000 sq. ft. facility about 18 months ago, I had thought I might sublease about 10,000 sq. ft. However, within three months of moving in, it became apparent that if we had 1,000 sq. ft. to sublease it would be a lot. Dan mentioned that when Software Arts first contracted to renovate the space they had planned to lease out the first floor (about 10,000 sq. ft.) but now, three months later, they are wondering if the building has enough space for their own rapidly-expanding operation.

An impressive operation it is! A Prime computer with a zillion megabytes of storage serves as the main software development machine. Scores of microcomputers are wired into this system. While the communication links are direct today, the new facility will be totally wired for Ethernet to allow micro-to-micro communication as well as micro-to-mainframe.

I have rarely seen so many microcomputers both in quantity and variety in one

David H. Ahl

location as I saw at Software Arts. Major projects include development of an advanced version of *VisiCalc* (to be marketed through VisiCorp), conversion of *VisiCalc* to every imaginable computer and, of course, the TK!Solver development work.

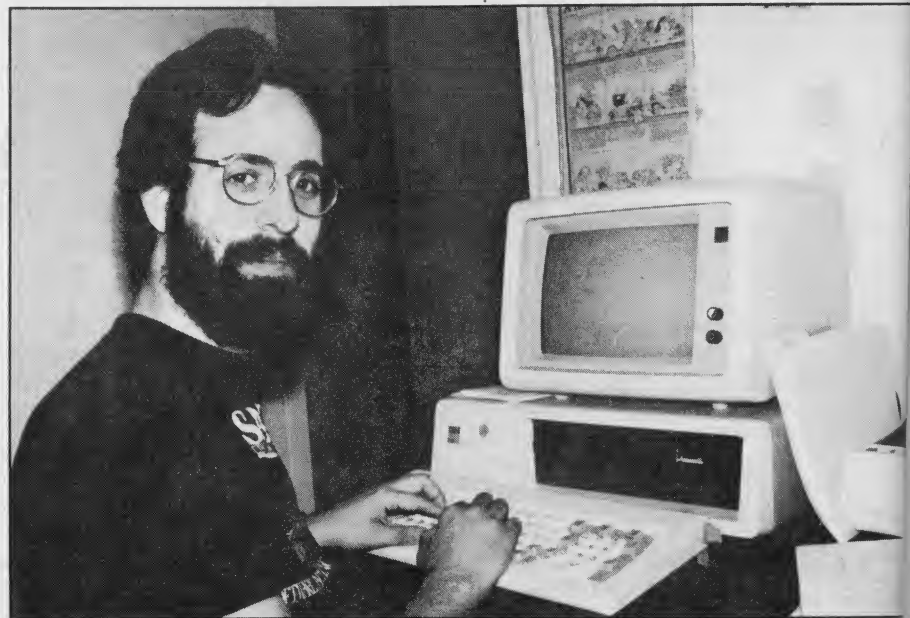
What is TK!Solver?

TK!Solver (TK for Tool Kit) was designed to provide professionals in engineering, business and other fields a personal computing tool with which to solve problems involving mathematical calcu-

lations and analysis. As with *VisiCalc*, it is not necessary to know a programming language to use *TK!Solver*. The user simply types in one or more equations and the known variables. *TK!Solver* then solves for the missing variables using either a direct solve technique or, if necessary, an iterative technique.

I journeyed to Cambridge to beat on *TK!Solver* mercilessly for nine non-stop hours. I asked the folks there to leave me alone with the software and documentation; after all, I wanted to approach it as a typical user. Diane Curtis, product manager for *TK!Solver*, kindly lent me her IBM Personal Computer and a corner of her cramped office for the day while she spent time with some customers and consultants.

My occasional questions were quickly



Dan Bricklin shows me a fine point of interactive problem solving with TK! Solver.

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TK! Solver continued...

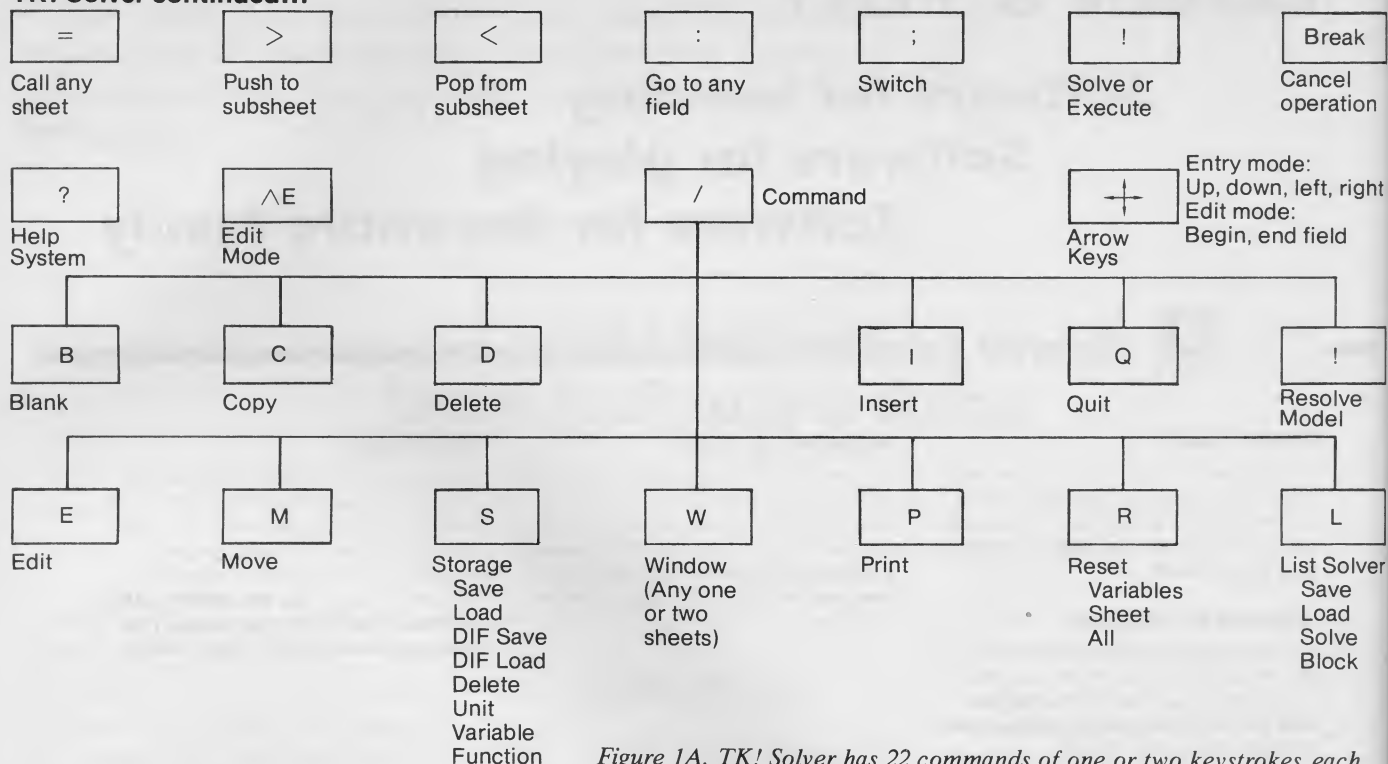


Figure 1A. TK! Solver has 22 commands of one or two keystrokes each.

answered by the genial folks at Software Arts but, for the most part, the account that follows represents the independent exploration of *TK!Solver* by a more-or-less typical user.

Getting Started

Upon loading the system, a two-line Message Area appears at the top of the screen. The first line, the Status Line, displays information about the status of the program. The second line, the Prompt/Error Line, displays messages.

The position indicator at the far left of the Status Line tells you the position of the cursor with a row number and letter (representing the label of the column). To the right of it is the contents of that field (data, label, etc.). This may seem redundant, but it is very useful because it shows the entire contents even though it may be more than can be displayed in the field, e.g., the status area may show a 20-character label or an 11-digit number even though the field may display only six or eight characters.

On the far right of the Status Line is a Memory Indicator which shows the amount of remaining memory in your work area. A handy feature is the message "Low" which is displayed when memory capacity drops below 1000 bytes. Essentially this cries out, "Save your file on disk before you lose it!"

The last character on the Status Line is a Solution Indicator. When you enter equations, an exclamation point appears here indicating that they are unsolved. It disappears upon solving a model but

reappears if any changes are made.

The Prompt/Error line is used for prompts which require a response, for messages telling the status of the program, and for error messages.

Help, Help!

The Help Facility is always available. It reminds you of features and commands you have learned but may not remember. However, as the instruction booklet points out, "It is not intended as a substitute for the Instruction and Reference Manuals."

When the first *TK!Solver* sheets are displayed, the Prompt/Error line displays the message:

For Help, type ?

This prompt disappears when you type any key. If you type "?", the Prompt/Error line displays the message:

Help: ? or topic:

The cue remains on the Prompt/Error line so that you can type and enter either a question mark or a topic you want to be explained.

A Menu of Commands

TK!Solver has a menu of 22 commands (see Figure 1A). These commands are used to enter formulae and data, manipulate data and units, solve equations, and move among the sheets, windows and operations. Sound complicated? It's really not. (The 11 sheets are shown in Figure 1B—more about them later.)

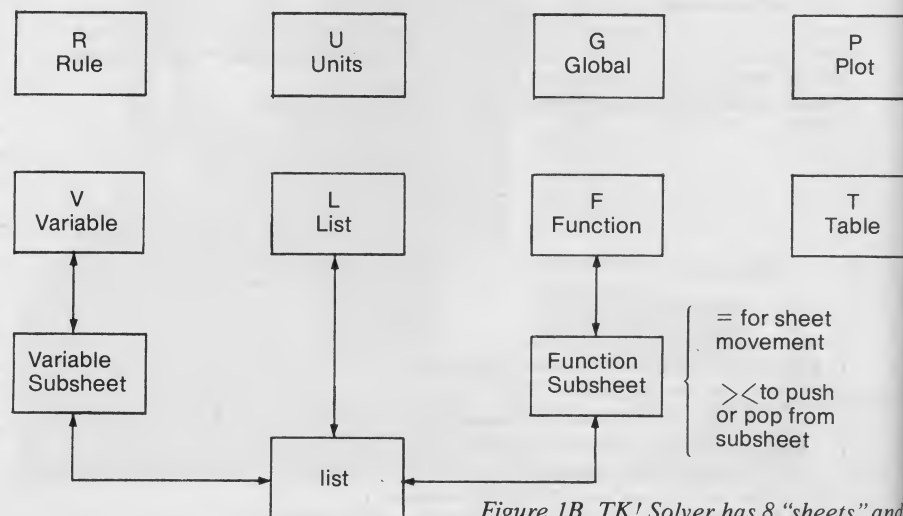


Figure 1B. TK! Solver has 8 "sheets" and 3 "subsheets."

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TK! Solver continued...



Diane Curtis, TK! Solver Product Manager at Software Arts, Inc.

I brought with me some data on municipal bonds. Basically, I was interested in using the system to compare bonds and do some portfolio calculations. Initially, I called up the "Rule Sheet" and entered two formulae:

$$A = C * F$$

$$Y = A / P$$

in which:

A = Annual Income
Y = Current Yield
C = Coupon
F = Face Value
P = Purchase Price

I then entered information about a Camden, NJ bond:

P = 13103 (dollars)
C = 5.3 (interest rate)
F = 25000 (purchase price)

Upon pressing ! to solve for the unknown variables, I got the following:

A = 132500 (Annual income)
Y = 10.112188 (Current yield)

Obviously I was not going to get \$132500 annual income for the next 13 years on a bond that cost \$13103. The problem, of course, was that I expressed percent as 5.3 rather than .053. Well, I want to express percent as 5.3 or 10.1 and not the decimal equivalent so I turned to the unit portion of TK!Solver. When the menu showed From and To, I entered the following for C and Y:

From	Pct
To	Dpct
Multiply by	.01

I recalculated but got the same result. Since this didn't help, I was tempted to change the formulas. However the Variable Status Sheet contained the clue to the dilemma. I simply wanted to display a different unit than my calculation unit. So I entered the following:

Display Unit	pct
Calculation Unit	dpct

Now, when I pressed ! to recalculate the table, I found that:

A (annual income) = \$1325
Y (current yield) = \$10.112188

Much more reasonable! But frankly I didn't like the 10.112188; good grief, who needs that many significant digits? However, TK!Solver, unlike VisiCalc, does not have a formatting capability. The solution was to enter another rule (formula) that stated:

$$yld = (int(10000 * y)) / 10000$$

Of course, I had to enter the unit table and define display (pct) and calculation (dpct) units for "yield" as I had for C and Y.

At this point the screen appeared as shown in Figure 2. As I entered the rules, the program automatically entered the variables in the same order as they appeared in the equations.

This wasn't too tidy, so using the Move command (/M), I moved the rows around. Also, using Delete (/D), I deleted Y since Yld showed the same thing. When I say deleted that does not mean it is gone—after all, it is a vital variable in the equations—but it is no longer displayed

(Si) Input: 13103

St	Input	Name	Output	Unit	Comment
	5.3	a	1325		
	25000	c		pct	
		f	10.112188	pct	
	13103	p			
		yld	10.11	pct	

===== RULE SHEET =====

S Rule

a=c*f
y=a/p
yld=(int(10000*y))/10000

(li) Input: 11.2

St	Input	Name	Output	Unit	Comment
	11.2	c		pct	Coupon Yield
	10000	f		\$	Face value of bond
	10375	p		\$	Offering price
		yld	10.79	pct	Current yield
		a	1120	\$	Annual interest

===== RULE SHEET =====

S Rule

a=c*f
y=a/p
yld=(int(10000*y))/10000

VARIABLE: y
Status:
First Guess:
Associated List:
Input Value:
Output Value: 10.1121880485
Display Unit: pct
Calculation Unit: dpct
Comment:

Figure 3. Variable subsheet for y.

in the variable table. To reassure myself that it still existed, I called up the variable sheet for Y and found it intact (see Figure 3).

I also added comments and filled out the unit field (with dollar signs). When all this was done, the screen appeared as in Figure 4.

creative computing SOFTWARE PROFILE

Name: TK! Solver

Type: Model building and solving tool

System: Many computers

Format: Disk

Language: Machine language

Summary: Easy to learn and use; wide variety of applications

Price: \$299 for TK! Solver; \$50 to \$100 for applications packs

Manufacturer:

Software Arts, Inc.
675 Massachusetts Ave.
Cambridge, MA 02139

Figure 2. Variable and Rule sheets after entering municipal bond formulae and data.

Figure 4. Same as Figure 2 with variable reordered and comments added.

TK! Solver continued...

Now I could use the model to compare some municipal bonds, at least in a simple sense. I decided to look for maximum current income from a list of bonds offered by a municipal bond dealer. Here is the data from the first four bonds. The last two columns are calculated with my TK!Solver model.

Bond	Coupon	Face	Price	Yield	Annual Income
Mt. Kisco 7/98	10.875	10000	9500	11.45	\$1088
Erie County 3/99	5.00	10000	5250	9.52	500
Mass Housing 10/87	2.00	10000	6275	3.18	200
Waterford, CT 6/90	11.20	10000	10375	10.79	1120

Naturally, there is more to comparing bonds than that since capital gains must be considered for the last three bonds. In fact, the total yield to maturity includes the capital gain plus the annual yield from the coupon, but at least I had a good start with TK!Solver giving me the yield and annual income from each.

Lists of Data

Instead of immediately going into the more complicated yield-to-maturity calculation, I decided to consider a portfolio summary. In this case, the list was longer, representing a portfolio of bonds accumulated over several years. I simulated this with data for 16 bonds taken from Leberthal offering lists. Instead of entering data individually, I wanted to enter a list of data, have all the calculations performed *en masse*, and see a list of output values.

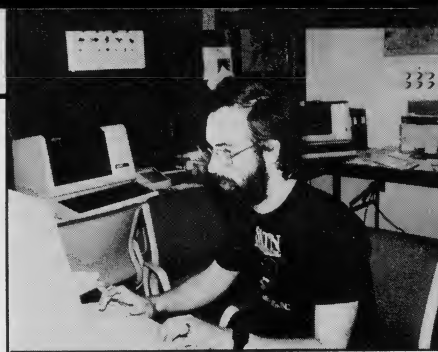
To do this, I entered the status area on the Variable Sheet and entered L (for List). To enter a list, you move the cursor over the list name on the Variable Sheet, press the right caret and the blank List appears. (Alternatively, a List can be entered from the List Sheet.) Typing values in order automatically fills in the list.

I then wanted the program to automatically solve my equations for all 16 sets of data I had entered in the lists. This was done by simply entering the list solver (/L) and pressing solve (!). You must have some dummy data in the input variables at this point or TK!Solver will just sit there not knowing which are input and which are output variables.

During the solving process, you can display each set of variables in turn on the screen or, for maximum speed, you can turn off the display from the Global Sheet (=G).

When the solving process was done, I called the List Sheet (=L) and, lo and behold, my output variables were now filled with values (see Figure 5).

I now had a fictitious half million dollar municipal bond portfolio in the computer. First I wanted some summary information about it. Here I had a choice: I could enter more rules or use TK!Solver as a



calculator. I chose the latter approach.

To do this, you go to any value (or numeric) field on any sheet and simply type in the calculation you wish to perform including variables, functions, lists, etc. First, I wanted the sum of the bond face values so I went to an empty field and typed:

SUM ('F)

The apostrophe indicates that all values of the list are to be summarized. In a split second 550,000 appeared. Ah ha, the face value of the portfolio was \$550,000 not one-half million. The sum of the purchase price was, \$459,899.

Okay, that was simple. Now for a tough

(7c) Comment: Yield to maturity

50 /!

LIST SHEET			
Name	Elements	Unit	Comment
y	16	pct	Coupon yield
c	16	\$	Face value of bond
f	16	\$	Offering price
p	16	pct	Current yield
yld	16	\$	Annual interest
a	16	pct	Yield to maturity
ytm	16		

RULE SHEET			
S Rule			

a=c*f			
y=a/p			
yld=(int(10000*y))/10000			

Figure 5. List sheet shows variables and elements (values) in each list.

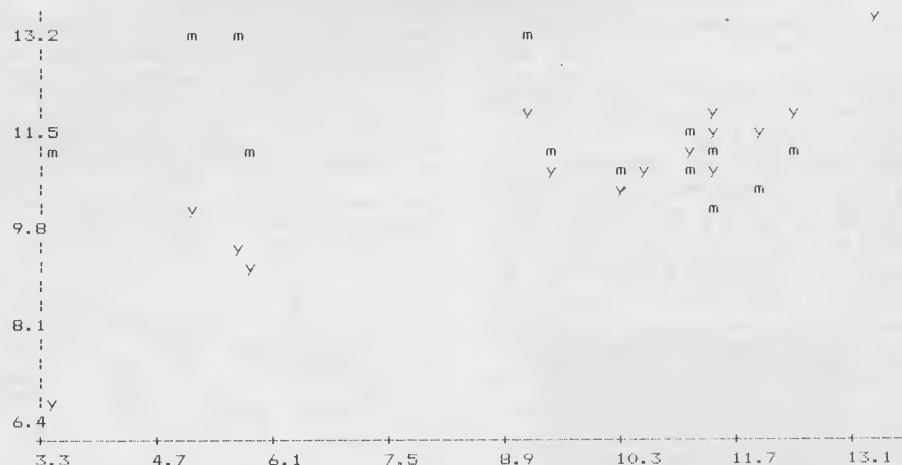


Figure 6. Plot of current yield (y) and yield to maturity (m) against coupon yield. TK! Solver offers many plot options.

TK! Solver continued...

(v) Variable Insert ON: yes

60 /

```
===== GLOBAL SHEET =====
Variable Insert ON:      Yes

Intermediate Redisplay ON:  Yes
Automatic Iteration ON:   Yes
Comparison Tolerance:    .00000001
Problem Scale:           .099999999999
Maximum Iteration Count:  10

Page Breaks ON:          Yes
Page Numbers ON:         Yes
Form Length:             16
Printed Page Length:     16
Printed Page Width:      30
Indentation:              0
Printer Device or Filename: PRN
Printer Setup String:
Line End (CR/LF or CR):  CR/LF
```

to see that current yield is directly related to coupon yield, and yield to maturity is inversely related.

From the Global Sheet it is possible to set the output page size. By reducing it, you can automatically scale a graph down if you want to jam it into a smaller space. The Global Sheet is also the place from which printer names and conventions are specified. (See Figure 7.)

Plotting is not limited to the scatter charts produced by *TK!Solver*. Data, variables, units, etc. may be saved on a disk using the DIF (Data Interchange Format) and used in other programs such as *VisiCalc* and *VisiPlot*. Conversely, data from *VisiCalc* may be read into *TK!Solver* from a DIF disk.

Iterative Problem Solving

Not all problems can be solved directly by simply substituting values in formulae. Let's consider a simple problem of a retail business. Say a video game cartridge has a manufacturer suggested list price of \$29.95 and the cost is \$21.00. We enter the formulae for margin and markup:

$$ma = (s-c)/s$$

$$mu = (s-c)/c$$

in which:

$$ma = \text{margin (\%)}$$

$$mu = \text{markup (\%)}$$

$$s = \text{selling price}$$

$$c = \text{cost}$$

Entering the data above and solving indicates a 29.9% margin and a 42.6% markup (see Figure 8).

But you know from experience that any margin less than 35% is cutting things too close. To make a 35% margin, what should the selling price be? I put 35 in margin as an input and blanked out (/B) the \$29.95 selling price. I pressed ! to solve and nothing happened. No longer was output defined by a direct equation.

To solve, I entered a guess (it could be anything, but I put in 30) and, after five iterations, *TK!Solver* indicated that 32.307692 was the selling price required to make a 35% markup (see Figure 9). Now you know why most retailers price video game cartridges at \$31.95.

Figure 7. The Global Sheet shows parameters that apply to the entire model, printer and plotter settings, etc.

Present Values

The present value of future cash flows are extremely important to all kinds of businesses. Let's say that you can automate a portion of your assembly line for \$10,000. Your volume is growing, so you expect this automation to be increasingly important for the next three years, but to drop in Year 4 as product obsolescence is reached. Hence, you expect your cash flow to be as follows:

cf0	-10000	(Cash flow in Year 0 or cost now = \$10,000)
cf1	2000	(Cash generated in Year 1 = \$2,000)
cf2	3000	
cf3	5000	
cf4	2000	

(3i) Input:

St	Input	Name	Output	Unit	Comment
29.95	s				Selling Price
21	c				Cost
	ma		29.883139	pct	Margin
	mu		42.619048	pct	Markup

S Rule

$$ma = (s-c)/s$$

$$mu = (s-c)/c$$

Figure 8. Variable and Rule Sheets for a markup and margins model. Model here solved for margin and markup given selling price and cost.

(1s) Status:

St	Input	Name	Output	Unit	Comment
		s	32.307692		Selling Price
	21	c			Cost
	35	ma		pct	Margin
		mu	53.846154	pct	Markup

S Rule

$$ma = (s-c)/s$$

$$mu = (s-c)/c$$

Figure 9. Same model as Figure 8 except it was used to solve for selling price (iteratively) given cost and desired margin.

You put in the following rule (or formula):

$$pv = npv(\text{rate}, cf0, cf1, cf2, cf3, cf4)$$

If the cash flow values were entered in a list as described above, the rule could also be expressed as:

$$pv = npv(\text{rate}, 'cf')$$

in which:

pv = present value

npv = a *TK!Solver* function for calculating net present value

cfn = cash flow in year N

Upon entering this formula, the data above, and 0 for present value, I tried to solve for the rate of return. No go. So I simply put in 1 as my guess for a rate and watched *TK!Solver* iterate to a solution of 7.4%. Pretty poor! I could do better in the money market.

So I put in 20% as my desired rate and blanked out the cash flow in Year 4. *TK!Solver* said I needed \$6960 cash flow to make it. Impossible.

I put back the original cash flows and blanked out the initial investment (cf0) and solved. In this case, it told me I couldn't invest more than \$7610 to get a 20% return.

Using this, I could try any number of different scenarios, perhaps entering my data in lists and plotting the various results.

TK! Solver continued...

Other Functions

A total of 34 functions are built into *TK!Solver*. They range from the expected trig, log and square root functions to advanced math and business functions. For example, inverse hyperbolic tangent and log base 10 functions are included. As mentioned earlier, dot product, list sum, and net present value are available, as are functions to return the minimum or maximum value in a list, count the elements in a list, or even apply a user function to a domain of values.

Other Applications

Software Arts will be introducing a series of applications packages consisting of a disk with rules, variables and units tables along with a detailed manual for each. Similar to the HP41C packages, these will give instructions for running the package as is but also will show the user how to change it to meet his own requirements.

I tried an early version of the mortgage package and found that a \$95,000 house with a 20% down payment and 30-year 18.5% mortgage would cost me \$1176 per month. However, if I could scrape together \$1400 per month I could reduce the term of the mortgage to 10 years(!) or purchase a \$115,000 house (see Figure 10).

Other packages are being prepared for education (a neat population model, among others), civil engineering, mechanical engineering, HVAC, convertible

(bo) Output: 1176.437839

68 /

===== VARIABLE SHEET =====				
St Input	Name	Output	Unit	Comment
95000	H		dollars	House price
19000	d		dollars	Down payment
	p	76000	dollars	Mortgage
30	n		years	Term
18.500000	i		interest	Interest rate
	A	1176.4378	dollars	Monthly payment
	T	423517.62	dollars	Total of payments

===== RULE SHEET =====
S Rule

" Simple Home Mortgage Model

H=p+d
A=p*(i/(1-(1+i)^-n)) "Monthly payment formula
T=A*n

(1i) Input:

67 /

===== VARIABLE SHEET =====				
St Input	Name	Output	Unit	Comment
	H	115442.52	dollars	House price
25000	d		dollars	Down payment
	p	90442.518	dollars	Mortgage
30	n		years	Term
18.500000	i		interest	Interest rate
1400	A		dollars	Monthly payment
	T	504000	dollars	Total of payments

===== RULE SHEET =====
S Rule

" Simple Home Mortgage Model

H=p+d
A=p*(i/(1-(1+i)^-n)) "Monthly payment formula
T=A*n

Figure 10. Screen photo shows mortgage model used to calculate number and amount of monthly payments. Below the same model calculates that a \$1400 monthly payment would allow buying a house costing \$115,442.



bonds, institutional portfolio management and many more.

The Ultimate Solution?

Ever since I attended Software Arts' initial press conference introducing *TK!Solver*, people have asked me, "Is it another *VisiCalc*?"

Frankly, I don't know. It seems that many of the users at which *TK!Solver* is being aimed are already computer literate and are probably using timesharing (with packaged software) or a microcomputer (with self-written programs in Basic). However, both of these groups probably would be more than enthusiastic about a user-friendly tool like *TK!Solver*. It may not sell as many computers as *VisiCalc* has, but it certainly will win as many friends. □



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C64 Software Products:

EPYX-Temple of Apshai ³	Disk	39.95
EPYX-Upper Reaches of Apshai ³	Disk	19.95
EPYX-Curse of Ra ³	Disk	19.95
EPYX-Sword of Fargoal ³	Disk	29.95
EPYX-Crush, Crumble & Chomp ³	Disk	29.95
Wordpro 3+ Wordprocessing ⁵		75.00
Info Designs Soft Pack (G/L,A/R,A/P) ⁶		475.00
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Financial Spreadsheet for C64		135.00
Super Sprite	Cassette	35.00
Ultra Mail 64	Cassette	20.00
Personal Finance C64		75.00
Tax Qwik/Personal Tax Program for C64 ¹¹		75.00
Quick Brown Fox C64 ¹²		55.00

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VTE/CTE Terminal Program for VIC & C64		
	Cassette	8.95
	Diskette	12.95
VT-40 VIC 40 Col Terminal Communicator		
Cartridge with Downloading		45.00
VIC Super Expander ¹		49.95
VIC Programmers Aid Cartridge ¹		45.00
VIC Intro to Basic Part I & II ¹		45.00
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Household Finance ²	Cassette	25.00
	Disk	30.00
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(16K Extra) ³	Cassette	24.95
EPYX-Datestones of Ryn		
(16K Extra) ³	Cassette	19.95
EPYX-Rescue at Rigel		
(16K Extra) ³	Cassette	29.95
EPYX-Crush, Crumble & Chomp		
(16K Extra) ³	Cassette	29.95
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 Signature _____

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Electronic Canvas Meets Lost Masterpiece

The Possibilities

You may be getting tired of hearing me rave about the graphics potential of the Atari. Well I'm not going to rave anymore—I am just going to show you some pictures. They will save me thousands of words.

Paint is the most ambitious joystick-based drawing system available for the Atari computer. It has capabilities that outstrip systems costing five times as much. It allows even the absolute beginner to experiment with most of the graphics potential the Atari brings to micro-computing. And it is so simple, even a child can use it. In fact, it was designed with children in mind. I cannot think of a better inducement to kids than a program such as this.

There are actually two drawing programs included with *Paint*, SimplePaint and SuperPaint. SimplePaint is an unimposing, scaled-down version of the main program, SuperPaint, devoid of powerful features and therefore also of all complexity. SimplePaint stands more as a

Figure 1. Rectangles filled with a variety of plaids. Black circles "cut" out of the background with a jagged brush suggest a sculptured effect.



John Anderson

tutorial starting point than a valuable program in its own right. It is doubtful whether the user, child or adult, will spend

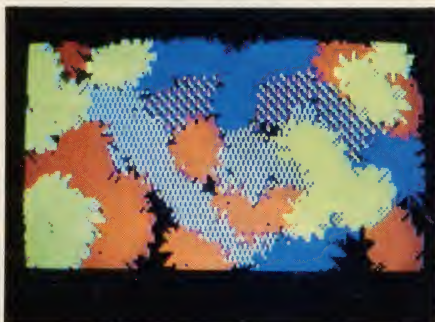
The system is able to cater to the beginner and the expert alike, without inconvenience to either.

much time with it. Not after he discovers the majesty of SuperPaint.

The Features

The joystick is manipulated to move a blinking crosshair around the screen.

Figure 2. Varied brushstrokes can evoke images of splashes of paint.

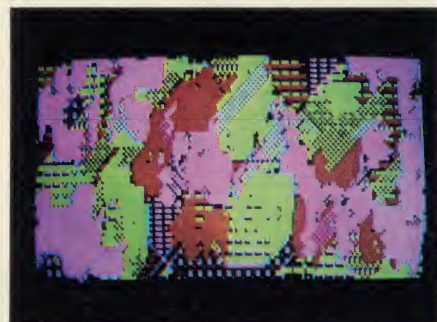


Press the trigger, and the cursor draws. You may choose from nine different "brushes," in nine different widths, for a total of 81 styles of brushstrokes. You may choose a brush that paints a wide swath in one direction, and a narrow one in another. You can choose a fine line (resolution to graphics 7), or paint huge areas at a time.

At the bottom of the screen ten "paint pots" are displayed. Move the cursor into one of the pots, and press the trigger. Your brush will pick up the new color. Four of these are solid colors, six are patterns—plaids, if you like. Each of these colors as well as their luminosities can be changed. Each of the plaids can be altered as well. They default to a very pleasing set, but it is tough to avoid playing with them.

Next to the paint pots are two other symbols. One is an H, and when the cursor is moved onto it and the trigger pressed, the help menu appears. Everything about *Paint* can be accessed from its superbly designed system of nested menus. As the user gains proficiency, commands can also be input to the keyboard directly.

Figure 3. A star-shaped brush resulted in these broad strokes of color and pattern.



All pictures by the author, created with the Paint or Video Easel graphics composing systems.

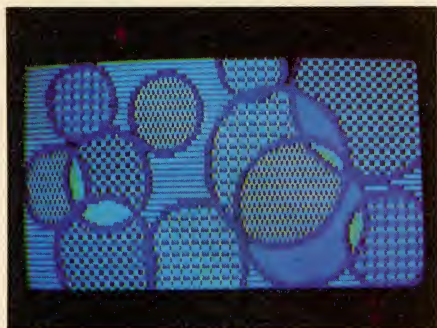


Figure 4. Circles Number 1.

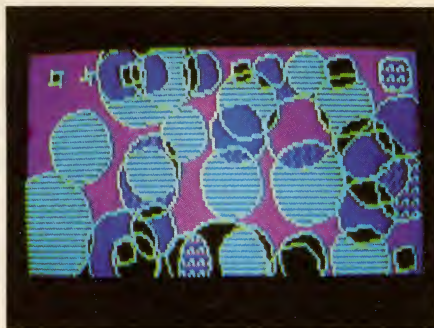


Figure 5. Circles Number 2.



Figure 6. Solid color can be reworked with patterns, resulting in this kind of effect.

Thus the system is able to cater to the beginner and the expert alike, without inconvenience to either.

The symbol to the far right, looking like squares within squares, is the zoom symbol. Move the cursor onto it and press, and the picture enlarges to graphics 5. Press it again to move to graphics 3. Move the cursor from within these modes, and smooth scrolling takes place. You can travel smoothly throughout the painting in these magnified modes, doing detailed work with great accuracy.

Other commands place real graphics power in your hands. Aside from the direct drawing mode, you can choose the automatic generation of straight lines, rectangles, and circles. They will place themselves exactly where you indicate, in the size and brushstroke you have chosen. This capability is indispensable in building designs. Once closed shapes have been formed, either freehand or automatically, they can be filled with any color or plaid. The fill coloring is quick, perfect, and fun to watch.

Colors and luminosities can be changed as you look at a painting, or as you look at an electronic palette, which indicates the choice on a rainbow-hued color menu. Plaids can be changed only while you are looking at the color menu. The cursor then becomes a roving square. You

choose the pattern you want by placing the cursor on displayed pattern bars and pressing the trigger.

Other features round out the strengths of the program. The responsiveness of the nondrawing cursor can be damped, as can the responsiveness of the cursor when it is drawing. This may seem a trivial feature, but is very handy when doing detail work. I tended toward using a quick cursor when moving without drawing, and a slower cursor when drawing, for added control.

Okay, so you have created a masterpiece. What to do with it? Save it to disk, of course. Multiple pictures can be saved to a single disk. The Art Show feature allows all pictures on a disk to be displayed. You can use multiple drives, and retrieval time is very quick. You may even number the order in which you want paintings to be displayed. You could conceivably create sequences approaching animation using this technique. Press the space bar to pause on a single picture. Press it again to continue. Another command allows pictures to be deleted.

The Concept

Paint is an effort of SuperBoots, a talented and promising software team working for the Capitol Children's Museum in Washington, D.C. The programmers are Eric Podietz, Jimmy Snyder, and Mark Scott.

Obviously intended to be an educational package, *Paint* manages to convey fully the flavorful, imagination-spurring mood fostered at the Children's Museum. As a program designed to involve children, it is a masterpiece.

The Shortcomings

Accompanying the remarkable software is an equally ambitious softcover book, which in addition to documenting the package, attempts to present an overview of art history from the dawn of man to the dawn of microcomputers.

On this account it does not do anywhere near as well. The scope of the task, in contrast to the space allotted, nearly dooms it to failure on the launch pad. The fact that the text suffers from a ter-

restrial case of the "cutsies" strikes the fatal blow.

Certain passages of the book strike, well, like a blow to the vitals. "Nothing, with the possible exception of fire, acne, the wheel and sex, will have a greater impact on your life than the computer,"

Unfortunately, no provision is made for recalling paintings from any other programs.

reads the introduction to chapter two. A paragraph in chapter three reads "Yes, no, yes, yes, maybe, hmmm, I don't know, could be, yes, no, no, yes, yes, kind of, oh, who knows?" This kind of drivel typifies what some adults think kids eat up. Sorry; only dumb adults, if anyone, see value in patronizing kids.

In fairness, the book is well-intentioned, and includes some handsome color plates, ranging from Matisse to computer-generated graphics by Mark Lindquist. The book unfortunately ignores the work of Tom deFanti, Abel Associates, and MAGI. In its ineffective but passionate argument for the legitimacy of computer-generated art, it nearly makes the case of opponents like Robert E. Mueller (see "When is Computer Art Art," in the January issue of *Creative Computing*). Proponents of computer art will cringe at the uneven and pronouncement-packed propaganda presented in the text of *Paint*.

But wait a minute. The package was designed to stimulate the imagination, and that it does. And despite the fact that the accompanying text is putrid, the package remains superb.

Of course it could have been better. Unfortunately, no provision is made for recalling paintings from any other programs, Basic or otherwise, aside from

creative computing

SOFTWARE PROFILE

Name: Paint

Type: Graphics composer

System: Atari 800 48K

Format: Disk

Language: Machine/Basic

Summary: Impressive, powerful graphics package making full use of the Atari.

Price: \$39.95

Manufacturer:

Reston Software
11480 Sunset Hills Rd.
Reston, VA 22090

Simplified Software Systems
118 Third Ave. N.W.
P.O. Box 1192
Hickory, NC 28601
(704) 328-2389
Business
Radio Shack, Zenith Z-100

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(617) 232-5020
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(916) 366-1195
Recreational
Apple, Atari, Commodore, IBM PC,
VIC-20

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6 Main St.
Ogdensburg, NY 13669
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Recreational
Apple, IBM PC

Sliwa Enterprises, Inc.
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Educational

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Small Computer Co., Inc.
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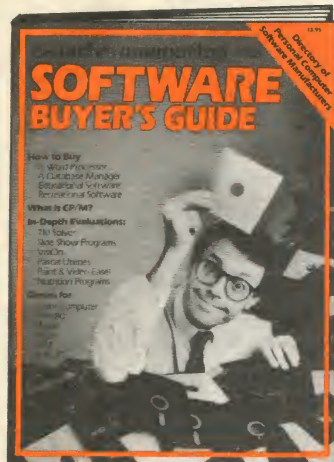
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Reader			Reader			Reader		
Service No.	Advertiser	Page	Service No.	Advertiser	Page	Service No.	Advertiser	Page
138	Aardvark Technical Services	58	128	Hayes Microcomputer Products	41	164	Protecto Enterprizes	111
110	Advanced Logic Systems	15	191	Home Entertainment Discount Center, Inc.	136	105	Quick Brown Fox	7
166	Affine Software	115	116	Howard Software Service	25	122	Research in Speech Technology	34
193	AGS Software	136	151	Human Engineered Software	95	146	Reston Publishing	77
129	Allenbach Industries	43	153	Human Systems Dynamics	98	143	R.H. Electronics	68
195	Alpha Software Corp.	C4	168	I.J.G. Computer	119	134	Roklan Corp.	49
178	Anec Software	125	196	Infocom	10-11	190	Royal Software	134
103	Avalon Hill Game Co.	2	183	Innosys	126	113	Howard W. Sams	21
142	Beagle Brothers	67	181	Instant Software	125	126	SEI Software	39
107	Beaman Porter	9	171	Jini Microsystems, Inc.	132	109	Sensible Software	14
139	BRS/After Dark	61	182	Jones Futurex, Inc.	126	111	Sierra On-Line, Inc.	17
102	Business Solutions	1	108	Kensington Microware	13	160	Sir-Tech	105
167	CBS Book Co.	117	194	Leading Edge	C3	156	SJB Distributors	101
162 & 163	C-Load Magazine	109	185	Lightning Software	127	187	SoftCorp International	132
155	Computability	99	137	Lyco Computer	57	177	Softtraders International	124
117	Computer Advanced Ideas	27	121	Maxell	33	184	Software City	127
154	Computer-Ed.	99	140	Micro Sparc	63	120	Software Publishing Corp.	30-31
188	Computer Entrepreneur Publishing Company	133	173	MicroSpec	123	165	Software t'Boot	111
130	Computer Exchange	44-45	189	Microware Distributing	134	148	Southwest Microsystems, Inc.	84
147	Computer Mail Order East/West	79	176	Mind Movers	124	101	Spectra Video	C2
169	Computer Outlet	121	114	Mind Systems	22	106	St. Martin's Press	8
172	Computer Shack	123	104	Muse Software	5	174	Sterling Swift Publishing Company	124
115	Computronics	23	141	National Software	65	144	Strictly Software	69
152	Conduit	97	179	Pacific Exchanges	125	192	S.W. Edpsych Services	136
119	Continental Software	29	159	Pacific Exchanges	101	161	Synapse Software	107
186	Cornsoft Group, The	131	124	PMI, Inc.	36	150	Systems IV Limited	93
180	DataWare, Inc.	125	133	PMI, Inc.	47	132	Tech Products	47
127	Discount Software Group	40	149	Powersoft	87	136	United Computer Corp.	55
118	Educational Software, Inc.	28				112	Videx	19
145	800-Software, Inc.	75						
170	Electronic Specialists	122						
135	EPYX	51						
157	Front Runner	101						
125	Great Plains Software	38						



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119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226
227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244
245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298
299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316
317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334
335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388
389	390	391	392	393	394	395	396	397	398	399	400						

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119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226
227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244
245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298
299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316
317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334
335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388
389	390	391	392	393	394	395	396	397	398	399	400						

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From a Data Base Manager II Record
(that you sort or search for):

A	B
1 FIRST NAME	ROGER
2 LAST NAME	SMITH
3 BALANCE	3261
4 PAST DUE	30
5 CALCULATED INTEREST	
6 AT 1.5% / MO	
7 JS	48.92

Go to VisiCalc and
Calculate Interest Charges

RECORD NUMBER 7	
1 FIRST NAME	: ROGER
2 LAST NAME	: SMITH
3 BALANCE	: 3261
4 PAST DUE	: 30

Dear Mr. Smith:
Your interest fee is \$48.92.
Please remit this amount immediate
Your timeliness will be much apprec

Finally, go to Wordstar
and Automatically Mailmerge
a Customized message

Introducing Data Base Manager II – a powerful, yet easy to use software product. It interfaces effortlessly with VisiCalc and Wordstar in just a few keystrokes. Howard Herbin, Computerland of Niles, Illinois says: "Alpha's Data Base Manager II is the first I have seen which is 100% VisiCalc and Wordstar compatible – it is truly useful."

Data Base Manager II features: date functions, multi-level searching, phonetic search, easy record reconfiguration, powerful report writer, hard disk compatibility, multi-level memory and disk based sorting for large files and more.

Data Base Manager II is compatible with all spreadsheets which support DIF files, such as 123™, and with most word processors. To top it all, files that you down load from your mini or main frame can be easily read by Data Base Manager II through its unique data exchange (DEX) format. All Alpha Software products come with spoken instructions. Product and Demo available at COMPUTERLAND and other fine dealers. Call 1-800-451-1018, for your nearest dealer. Remember – only Alpha Software offers you toll free phone support.



FOR THE
IBM PC

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